

SIEMENS

SIREMOBIL Compact L

SP

Service Instructions

SIREMOBIL Compact L
from Serial number ≥ 03000

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Required documents

- SIREMOBIL Compact L circuit diagram
- SIREMOBIL Compact L log book
- For the laser targeting device where used: Adjustment Instructions / Laser targeting device RXR2-130.032.01...

Required tools, measurement and auxiliary devices

NOTE

All tools, measurement and auxiliary devices with the exception of those marked "*" are listed along with their specifications in the STC (Service Tools Catalog).**

- DMM e.g. "Fluke 8060 A", Part No. 97 02 101 Y4290
- Oscilloscope > 50 MHz e.g. Tektronix 2232, Part No. 97 02 234 Y3155
- Dose measurement device e.g. PTW-DALI (no longer in ARTD) or PTW-NOMEX, Part No. 97 08 637 Y0388 or PTW-DIADOS, Part No. 97 17 612 Y0388
- Protective conductor meter e.g. Safety meter, Part No. 44 15 899 RV090 or Bender safety meter, Part No. 97 06 979 Y0526
- Service PC with WINDOWS 3.1 or 3.11 operating system*
- Service software (refer to SIREMOBIL Compact L log book)*
- Connection cable, Service PC - SIREMOBIL Compact L (e.g. Part No. 99 00 440 RE999)
- 1 set of resolution tests e.g. Part No. 28 71 820 RE999
- 1 set of radiation filters e.g. Part No. 97 98 596 G5321
- Center cross e.g. Part No. 96 60 051 RE999
- Special purpose oil (Optimol GmbH, Viscogen KL 300, 40g) Part No. 73 95 353 RH090
- Heat conducting paste WPS e.g. Part No. 20 48 650 SRN 6400
- Sealing compound Part No. 20 49 716 SRN 6002
- Tool kit*
- 1 set Allen keys*
- 200 N spring scale e.g. Part No. 44 15 113 RH090
- Torque wrench 20 Nm to 100 Nm e.g. Part No. 80 86 159 RE999

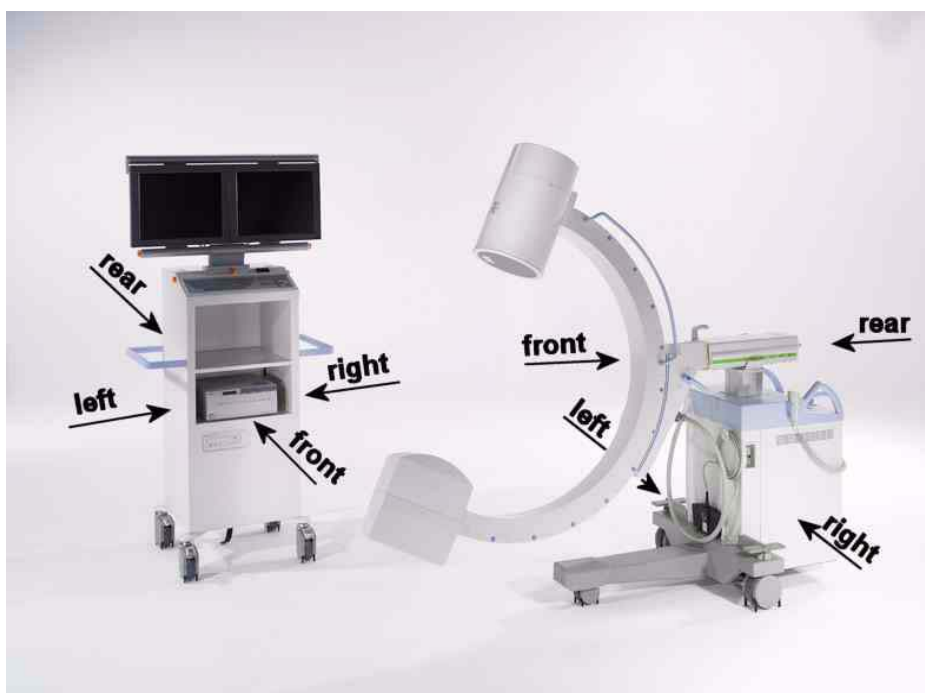


Fig. 1

Information regarding this document

These service instructions will assist you in adjusting the SIREMOBIL Compact L; beginning with serial number 03000 for routine operation. Not every adjustment is required each time the system is serviced.

Position labels

The labels used in these instructions (left, right, front and back) are explained in Fig. 1.

Safety Information

WARNING

Risk of physical injury or death and damage to property!
Observe

- the product-specific safety information in these instructions,
- the general safety information in the instructions TD00-000.860.01... and
- the general safety information according to ARTD Part 2.

Noncompliance can lead to death, physical injury or damage to property.

WARNING

Electrical voltage!

Noncompliance can lead to death, physical injury or damage to property.

After the system covers are removed, live parts are exposed. To prevent danger, the system must be disconnected from the line voltage before removing its covers. To do this, disconnect the system power plug or switch its power supply off and secure the power switch against accidental reactivation.

Any service required in connection with electrical voltage should be performed in accordance with general service information TD00-000.860.01... .

WARNING

Electrical voltage!

Noncompliance can lead to death, physical injury or damage to property.

After servicing the primary circuit of the ON/OFF assembly (e.g. replacing the ON/OFF assembly or any of its components), you must measure and record the equivalent leakage current (see system manual or logbook).

WARNING

Danger of infection with pathogens!

In the case of noncompliance death or physical injury can arise.

This product is released for operation in operating rooms and can be contaminated with infectious blood or other body secretions. Avoid all contact with blood or other body secretions!

Comply strictly with the preventive measures against infectious diseases specified in ARTD-002.731.37...!

⚠ WARNING**Electrical voltage!**

Noncompliance can lead to death, physical injury or damage to property.

After completing all service work and attaching all system covers, you must perform a protective ground wire test according to ARTD-002.731.17... .

The protective ground wire resistance must not exceed 0.2 ohms.

⚠ WARNING**X-ray radiation!**

Noncompliance can lead to death or physical injury.

When performing service work involving the emission of X-ray radiation, you must observe the radiation protection regulations. The radiation activity must be kept as low as possible (low kV and mA levels, short radiation time).

Keep as far away from the radiation source as possible.

Radiation protection devices (lead partitions, etc.) and radiation-protection clothing (lead apron) must be used.

⚠ WARNING**Risk of physical injury and damage to property!**

When performing service work on the horizontal slide of the basic unit (for example, when performing repair work on the brake of the C-arm horizontal travel) it is possible that the C-arm may slide out of its position and fall onto the floor after the end stop has been removed.

Before dismantling the end stop, the horizontal travel brake must be locked and the horizontal slide must be mechanically locked to prevent it from sliding out. For example, the basic unit can be positioned in the room in such a way that the C-arm mechanically touches one of the walls.

⚠ CAUTION**Danger of injuries on mechanical parts!**

Non-compliance can lead to slight to medium injuries, especially of the hands.

Before starting service or maintenance work, check the system by a visual inspection for mechanical safety defects which in the case of inattention could lead to injuries. For example, projecting, bent or broken parts / covers, damaged plugs or cables.

Remove existing safety defects by replacement or repair of the damaged parts.

Perform the particular work steps with special care and attention to detail.

If needed, wear working gloves.

⚠ CAUTION

Risk of being burned by hot parts or components!
Noncompliance can lead to light or medium burns, especially of the hands.

Once the covers have been removed, parts or components (e.g. power components, heat sinks, solenoid brakes) become exposed which may exhibit temperatures of up to 50°C in operation. To prevent burns, switch off the system power supply and let the system cool off for at least 5 minutes before resuming work.

⚠ CAUTION

Electrical voltage!
Noncompliance can lead to damage to property.
ESD protection guidelines must be observed when servicing.

⚠ CAUTION

Danger of injury on mechanical parts!
Non-compliance can lead to minor up to moderately severe injuries, especially to the hands!

With covers removed, you can come into contact with parts such as flat plugs, threaded bolts, cut off cable ties or edges of components on which, in the case of inattention, injuries can arise due to crushing, cutting or grazing the skin, especially to the hands.

Perform the corresponding work with special care and attentiveness.

Wear working gloves if necessary.

Notes on the protective conductor resistance test

Observe the instructions in the safety rules for installation and repair (ARTD-002.731.17 ...).

The protective conductor resistance must be measured after every intervention in the system.

Documentation of the measured values is normally required only during periodical safety checks.

If parts / components decisively influencing the protective conductor resistance are replaced (e.g. replacement of the power cable, replacement of the power-up module, replacement of multicore connection cables, which also create the protective conductor connection between parts of the system (e.g. monitor cable or C-arm cable)), or if protective conductor connections have been repaired, then the protective conductor resistance must be measured, documented and assessed.

The measurement must be made according to DIN VDE 0751, Part 1 (see ARTD Part 2). In this case the protective conductor resistance to all conductive touchable parts of the system must be measured.

Make sure that control cables or data cables between the components of the system do not imitate any protective conductor connection.

During the measurement the mains cable and additional connection cables which also create the protective conductor connection between parts of the system (e.g. monitor cable between basic unit and monitor cart) must be moved section by section to detect broken conductors.

The protective conductor resistance must not exceed 0.2 Ohms.

The values must be recorded and assessed as repeat measurements in the protective conductor resistance record stating the measuring points.

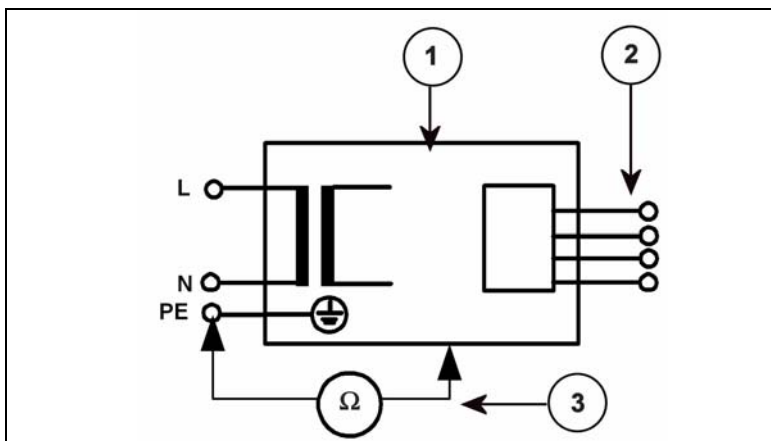


Fig. 2 Measuring circuit for measuring the protective ground wire resistance for units that are disconnected from power, in compliance with DIN VDE 0751-1:2001-10, Fig. C2.

1 = System

2 = Applied part (if present)

3 = Measuring arrangement (integrated in measuring instrument)

NOTE

Evaluate the results by comparing the first measured value with the corresponding values of preceding maintenance procedures or safety checks.

A sudden or unexpected increase of the measured values may indicate a safety-relevant defect - even if the limit value of 0.2 Ohms is not exceeded (protective ground wire or contacts).

Notes on system leakage current measurement

Observe the instructions in the safety rules for installation and repair (ARTD-002.731.17 ...).

⚠ WARNING

Electric voltage!

Noncompliance can lead to severe injuries and even death.

The system leakage current measurements may be performed on systems of protection class I only after the protective conductor test has been passed.

First measured value

In most cases, the first measured value has already been determined and documented in the system leakage current record.

The measurement was performed with the recorded line voltage, line frequency and with the recorded measuring equipment.

If the local line voltage or line frequency deviates from the line voltage or line frequency documented in the record (e.g. change of location with different local line voltage / line frequency), or if no documented measured values are available, then perform the system leakage current measurement. Mark the old values as invalid. Cross out the values, enter the comment "invalid values" and confirm with name, date and signature.

Adjust/program the system to the local line voltage / line frequency before the measurement.

Measurement

Perform the measurement according to DIN VDE 0751, Part 1 (see ARTD-002.731.17....), and record the value determined as the first measured value.

Measurement of the system leakage current according to the residual current procedure (measuring arrangement according to Fig. 2) must be given preference, since no danger for the person performing the measurement or any other persons arises during the measurement.

However, please note the minimum resolution of the leakage current measuring instrument and any additional manufacturer's data restricting the use of the measuring instrument.

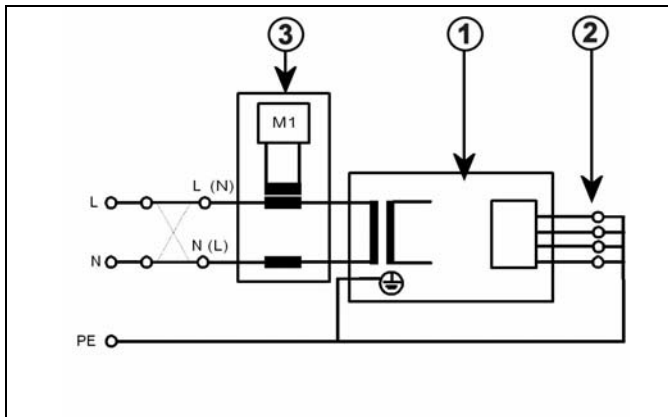


Fig. 3 Measurement circuit for measuring the system leakage current using the residual current procedure in compliance with DIN VDE 0751-1:2001-10, Fig. C6 for Protection Class I.

1 = System

2 = Applied part (if present)

3 = Measuring arrangement (integrated in measuring instrument)

If the direct measurement of the system leakage current is used (measuring arrangement according to Fig. 3), then the system must be set up insulated during the measurement and must not be touched during the measurement.

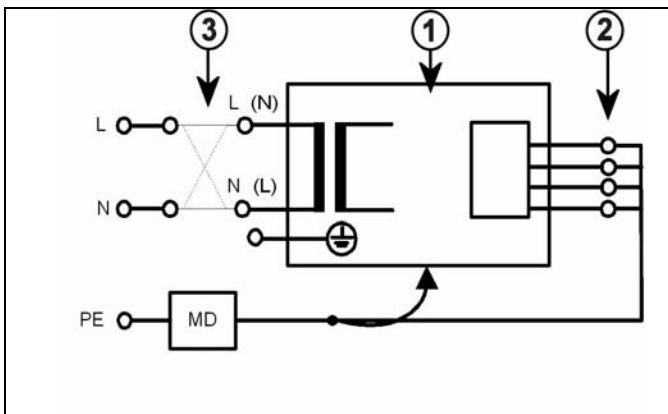


Fig. 4 Measurement circuit for direct system leakage current measurement in compliance with DIN VDE 0751-1:2001-10, Fig. C5 for Protection Class I

1 = System

2 = Applied part (if present)

3 = Measuring arrangement (integrated in measuring instrument)

⚠ WARNING

Electric voltage!

Noncompliance can lead to severe injuries and even death.

In the direct measurement of the system leakage current (measuring arrangement according to Fig. 2) the protective conductor is no longer connected with the protective conductor of the power socket. In the first case of fault, voltages up to the level of the line voltage can therefore occur on the protective conductor / housing of the system.

Housing parts of the system must not be touched during the measurement.

Third-person access to the system must be prevented.

The system must be switched on during the measurement. Measuring instruments with automated measuring sequences must therefore be set to manual measurement.

Enter the highest value as first measured value in the system leakage current record.

This value must not exceed the permissible leakage current values according to DIN VDE 0751-1:2001-10, Table F.1, line "System leakage current for devices according to remarks 1 and 3", of 2.5 mA.

Measure and record the current line voltage. If the measured line voltage deviates from the nominal voltage, then correct the measured value to the value corresponding to a measurement at the nominal value of the line voltage. Document this in addition.

Document the measuring procedure (residual measurement or direct measurement) and the measuring instrument used (designation and serial number).

File the record sheet in the system folder or logbook with the existing records.

Repeat measurement

When service or repair work is performed on the primary power supply circuit (e.g. repairs to the power-on circuit or replacement of the line filter), the system leakage current measurement must be repeated.

The same measuring conditions as in the first measurement apply.

Record and assess the highest value determined in the repeat measurement in the existing system leakage current record.

This value must not exceed the permissible leakage current values according to DIN VDE 0751-1:2001-10, Table F.1, line "System leakage current for devices according to remarks 1 and 3", of 2.5 mA.

Measure and record the current line voltage. If the measured line voltage deviates from the nominal voltage, then correct the measured value to the value corresponding to a measurement at the nominal value of the line voltage. Document this in addition.

Document the measuring procedure (residual measurement or direct measurement) and the measuring instrument used (designation and serial number).

NOTE

Evaluate the results by comparing the first measured value with the corresponding values of preceding maintenance procedures or safety checks.

A sudden or unexpected increase of the measured values may indicate that a fault has occurred in the primary circuit of the power supply (damaged insulation, damage caused by water ingress or humidity, defective interference suppressor, etc.) - even if the limit value of 2.5 mA is not exceeded.

Notes on Navigation systems, used with the SIREMOBIL Compact L

The SIREMOBIL Compact L can be used in combination with a navigation system of various navigation companies.

The use of the navigation system is in the liability of the customer.

Some service works can affect the accuracy of the navigation system.

If service works, listed below, were performed, inform the customer that the accuracy of the navigation system can be affected from the performed service works.

The accuracy of the navigation system in combination with the SIREMOBIL Compact L needs to be inspected before using it.

- All works with affect to the geometry of the C-arm, I.I. and CCD camera system
 - Remove / installation of the I.I.
 - Remove / installation of the I.I. housing
 - Remove / installation of the I.I. mounting ring
 - Remove / installation of the I.I. grid
 - Remove / installation of the I.I. optics
 - Remove / installation of the CCD camera system (board D4)
 - Remove / installation of the c-arm mechanics
 - Adjustment of the geometry of the image system (I.I. power supply)

Covers



Electrical voltage!
See Chapter 1, Safety Information.

Disconnect the line voltage plug prior to removing covers.

Basic system

Back cover

Removing the back cover

- Put on the foot brake.
- Remove the screws from the back cover.
- Pull the cover back approx. 25 cm.
- Unscrew the protective conductor from the cover.
- Pull the cover completely off and tilt it downward.
- Lift up the cover and raise both lateral metal brackets from the guide rails.

Installing the back cover

- Fit the lateral metal brackets back into the guide rail.
- Remount the protective conductor to the back cover.
- Lift the cover and push it forward. Be careful with the EMC spring contact.
- Replace the cover and tighten the screws.

Monitor trolley

Back covers

Removing the covers

- Remove the upper back cover plate of the log book compartment.
- Remove the protective conductor.
- Remove the lateral Allen screws from the lower back cover.
- Remove the protective conductor from the cover.

Installing the covers

- Begin with the lower back cover.
- Remount the protective conductor for the lower cover.
- Install the cover and tighten the screws.
- Remount the protective conductor for the Logbook cover.
- Install the cover and tighten the screws.

I.I. cover

- The cover for the image intensifier is secured by one screw.
- Insert the rubber lip in the groove prior to remounting the cover.
- When installing or deinstalling, handle the protective conductors with care.

I.I. mini power supply

- The control panel of the image intensifier mini voltage supply is accessible after removing the I.I. cover.
- The high voltage panel of the I.I. mini power supply is built into the C-arm (see Fig. 1).
- The cover (on the outside of the C-arm near the I.I.) is secured with two screws and can be removed from the rubber buffer of the I.I. After removing the cover, the high voltage panel is accessible.

SIREPHOS cover**NOTE**

The SIREPHOS cover has been sealed all around against contamination by dirt using a sealing compound (Part No. 20 49 716).

- Loosen the cover screws of the SIREPHOS cover.
- Use a sharp knife to cut open the sealing compound all around the cover.
- Lift off the SIREPHOS cover.
- Remove the sealing compound residue from the cover and from the SIREPHOS.
- On completing service, place the SIREPHOS cover on the SIREPHOS and seal it with sealing compound all around.
- Use a paper towel to wipe off excess sealing compound.
- Refasten the SIREPHOS cover with the cover screws.

Back stop plate at the C-arm horizontal support

⚠ WARNING

Risk of physical injury and damage to property!

When performing service work on the horizontal slide of the basic unit (for example, when performing repair work on the brake of the C-arm horizontal travel) it is possible that the C-arm may slide out of its position and drop onto the floor after the end stop has been removed.

Before dismantling the end stop, the horizontal travel brake must be locked and the horizontal slide must be mechanically locked to prevent it from sliding out. For example, the basic unit can be positioned in the room in such a way that the C-arm mechanically touches one of the walls.

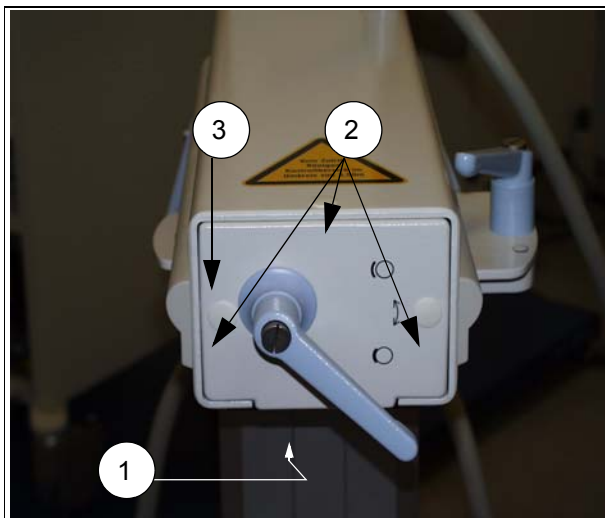


Fig. 5

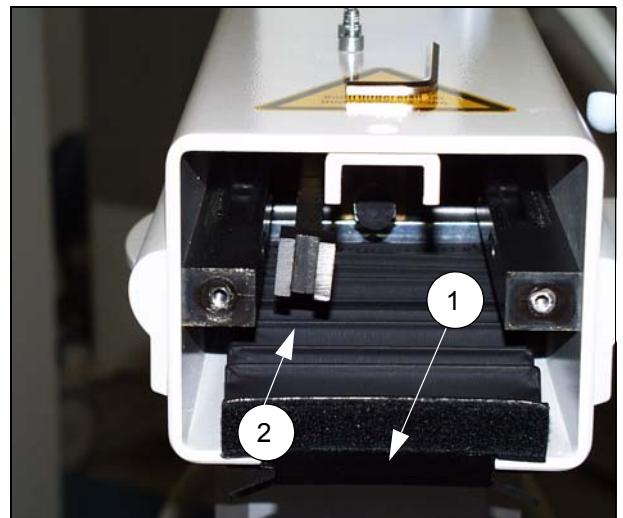


Fig. 6

For work that requires removal of the end stop (see 3/ Fig. 2), observe the warning above.

Removing the back stop plate

- Lock the horizontal brake.
- Remove the rubber cover (adhesive closure) underneath the horizontal support (see 1/ Fig. 2 and 1/ Fig. 3).
- Remove the caps (2/ Fig. 2).
- Remove the three screws (2 / Fig. 2).
- Remove the back stop plate (3/ Fig. 2). Pay attention to the coupling part set on the shaft of the handle mechanism (2/ Fig. 3).

Installing the back stop plate

- Place the coupling part (2/ Fig. 2) back on the shaft.
- Remount the back stop plate (3/ Fig. 1) and fasten it with the screws.
- Reinstall the rubber cover (1/ Fig. 1) and close it (adhesive closure).
- Check the function of the horizontal brake.

Concluding steps

- After completing all work, perform the protective conductor test (see ARTD-002.731.17).



WARNING

Electrical voltage!

See Chapter 1, Safety Information.

Disconnect the SIREMOBIL Compact L line voltage plug.

- Open the back cover of the monitor trolley.
- Measure the on-site line voltage and line frequency.
- Adjust transformer T1 to the required line voltage and line frequency. Refer to the label on the switch-on assembly.
- Adjust transformer T2 to the required line voltage and line frequency. Refer to the label on the switch-on assembly.
- Check fuses F1 and F2 to see if they correspond with the values on the label of the switch-on assembly and replace them, if necessary.
- Mark the correct line voltage and line frequency on the line voltage label at the back of the monitor trolley.

Checking the line voltage on the monitor trolley

- Connector X10 for the basic system must be disconnected.
- The monitor, memory device and other devices, if present, such as multiformat camera, video printer or video recorder must be disconnected from the line voltage supply.
- Check the secondary voltages for line voltage transformer T1 according to Table 1.

	from test point	to test point	Voltage	Comment
	Transformer T1.31	Transformer T1.32	190 V ~ to 205 V ~	cannot be adjusted
	Transformer T1.31	Transformer T1.33	230 V ~ to 246 V ~	cannot be adjusted
	Line voltage cable Memoskop, N	Line voltage cable Memoskop, L	230 V ~ to 246 V ~	cannot be adjusted
	Line voltage cable Monitor 1, N	Line voltage cable Monitor 1, L	230 V ~ to 246 V ~	cannot be adjusted
Option:	Line voltage cable Monitor 2, N	Line voltage cable Monitor 2, L	230 V ~ to 246 V ~	cannot be adjusted
Option:	Line voltage cable Multisport, N	Line voltage cable Multisport, L	230 V ~ to 246 V ~	cannot be adjusted
Option:	Line voltage cable Video printer, N	Line voltage cable Video printer, L	230 V ~ to 246 V ~	cannot be adjusted
Option:	Line voltage cable Video recorder, N	Line voltage cable Video recorder, L	230 V ~ to 246 V ~	cannot be adjusted
Option:	Optical isolation line voltage cable, N	Optical isolation line L voltage cable	230 V ~ to 246 V ~	cannot be adjusted

Tab. 1

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Low voltages

Check the operating voltages for the SIREMOBIL Compact L against the values in Table 1.

from test point	to test point	Voltage	Tolerance	Potentiometer
M14.4 (0V)	M14.5/6 (+5 V)	+ 5 V	$\pm 0.2 \text{ V}$	M14. +5 V/Adj.
M14.3 (0V)	M14.2 (+15 V)	+ 15 V	$\pm 0.1 \text{ V}$	M14. +15 V/Adj.
M14.3 (0V)	M14.1 (-15 V)	- 15 V	$\pm 0.5 \text{ V}$	M14. -15 V/Adj.
D3.X8.1 (0V)	D3.X8.3 (+26,75 V)	+26.75 V	$\pm 0.25 \text{ V}$	D3.R3
M13.S- (0V)	M13.S+ (+13 V)	+13 V	$\pm 0.2 \text{ V}$	M13.TR1
D3.X1.7 (0V)	D3.X1.9 (+24 V)	+ 26.5 V to + 29.5 V	n.a.	not adjustable

Tab. 1

I.I. voltages



Electrical voltage!
See Chapter 1, Safety Information.

Do not touch any part of the I.I. mini voltage supply!

The voltages E1 / E2 / E3 and A may be taken from the I.I. test protocol and checked or adjusted against the control test points listed in Table 2.

Voltage	Test point	Ground point (0V)	Potentiometer for full format	Potentiometer for zoom format	Voltage divider ratio
E1	UE1	$\perp$	P10	P11	1:1
E2	UE2	$\perp$	P6	P7	1:1
E3	UI 15	$\perp$	P2	P3	1:10000
30 kV, Anode	UI 30	$\perp$	P1	P1	1:10000

Tab. 2

- If the system is used in combination with a navigation system, inform the customer that the accuracy of the navigation system needs to be checked.

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Control board D1, Host

- Connect the service PC to the serial service interface on SIREMOBIL Compact L.
- Start the service program.
- Insert the "Parameter" diskette in drive A.
- Select the Download menu and start the download (ARC / Fil. / Host).
- After the download has successfully been completed (1 minute), wait for the system to boot.
- The SIREMOBIL Compact L is operational.

NOTE

If you cannot run download (e.g. power failure during download):

- Switch the SIREMOBIL Compact L off and back on
- Restart download

Storage of the error log as ASCII file

- If you store the error log using the backup function of the service program, the error log will be stored as binary file and can't be read with a word editor.
For easier evaluation of the error log, it is also possible to store it as an ASCII file.
For easier service support from the USC or HSC, please send the error log as an ASCII file.

NOTE

The parameter diskette must be in drive A before the start of the service program and during the service work. Without a parameter diskette in drive A, the short error messages will not be stored in the error log file and the text "no error text available" is stored behind the error codes.

Prerequisites:

The service PC is already connected, the service program is already started.

- Select the menu "Diagnostics...".
- Select the menu "Error log".
- Click on the button "Get from unit". Wait until the error log is transferred to the service PC.
- Click on the button "Export to file".
- Select your hard disk drive for storage of the file.
- For the file name, please enter the current date, the part number and the serial number of the unit as described in the example.

Example: The current date is (DD-MM-YY): 29-12-05
The unit Part No. is: 3780629
The unit Serial No. is: 03234
Enter the file name: 29-12-05_3780629_03234.txt

- Store the file on the hard disk drive of the service PC to a path of your choice.
- Exit the service program.

- Copy the previously stored file to a formatted diskette.

Installing the MEMOSKOP CX200 operating system (Image CD).

NOTE

- The MEMOSKOP CX200 consists 2 components:
 1. Integrated PC with operating system software
 2. Image memory hardware und software.
- The transfer and installation of the operating system for the integrated PC is described in this section.
- The transfer and installation of the image memory software is described in the next section, "Installing the MEMOSKOP CX200 image memory software".

NOTE

- If only the operating system software of the integrated PC is to be reloaded, it is not necessary to load the image memory software in addition.
- If only the MEMOSKOP CX200 image memory software is to be reloaded, it is not necessary to load the operating system software of the integrated PC in addition.

- Switch on the system.
- Open the CD drive and insert the Image CD 71 42 461.
- Close the CD drive again.
- Switch off the system.
- Connect the included PS2 keyboard to the Memoskop CX200 via the "PC Keyboard" socket.
- Plug the adapter included with delivery (15-pin SUB-D plug, incl. in log book) into the "Printer" socket of the MEMOSKOP CX200. If necessary, temporarily unplug the remote cable to the printer beforehand.

NOTE

- On this adapter, pin 15 is jumpered to pin 10. This causes the messages of the integrated PC (Bios and WINDOWS XP messages), which are normally suppressed, to be displayed on monitor B during booting.

- Switch on the system again.
- As soon as the prompt "Press any key to boot from CD" appears on monitor B, press a key on the PS2 keyboard.

The integrated PC of the MEMOSKOP CX200 is started with the operating system on the CD.

The image file stored on the CD is copied to the integrated PC of the Memoskop CX200.

The installation is started.

After successful installation of the operating system, the message "Installation completed, remove the CD disk and reboot" appears.

- Wait till the message "Installation completed, remove the CD disk and reboot syem" appears.

- Remove the CD from the CD drive.
- Switch the system off and on again.

During the booting phase the operating system of the integrated PC is automatically configured. When the configuration is complete, the MEMOSKOP CX200 is automatically reset and booted once again.

- Wait until the operating system is configured.

Installing the MEMOSKOP CX200 image memory software

NOTE

- The MEMOSKOP CX200 consists of 2 components:
 1. Integrated PC with operating system software
 2. Image memory hardware und software.
- The transfer and installation of the image memory software is described in this section, "Installing the MEMOSKOP CX200 image memory software".
- The transfer and installation of the operating system for the integrated PC is described in the previous section, "Installing the MEMOSKOP CX200 operating system (Image CD)

NOTE

- After the installation of the MEMOSKOP CX200 image memory software, the licenses and parameters must be reloaded. See the section "MEMOSKOP CX200 Restore"

- Turn off the system.
- Connect the included PS2 keyboard to the Memoskop CX200 via the "PC Keyboard" socket.
- Plug the adapter included with delivery (15-pin SUB-D plug, incl. in log book) into the "Printer" socket of the MEMOSKOP CX200. If necessary, temporarily unplug the remote cable to the printer beforehand.

NOTE

- On this adapter, pin 15 is jumpered to pin 10. This causes the messages of the integrated PC (Bios and WINDOWS XP messages), which are normally suppressed, to be displayed on monitor B during booting.

- Switch on the system again and wait for the MEMOSKOP CX200 to boot up.
- Press the key combination CTRL + ALT + DEL on the PS2 keyboard.
- Select the "Task Manager" button and then press the Return key. The Task Manager is now active.
- Open the "New Task" window by pressing the key combination ALT + N on the PS2 keyboard. The "New Task" window appears.
- Enter the following command in the "New Task" window:
cmd
- Press the Return key.
- Enter the following command in the command window:
**cd **

- Press the Return key.
- Enter the following command in the command window:
cd windows\system32
- Press the Return key.
- Enter the following command in the command window:
DL001.exe (filename of the binary file)
- Press the Return key.

NOTE

-
- **Example: filename of the binary file is "Siemens.V3.16.bin"**
 - **Enter command:**
DL001.exe Siemens.V3.16.bin
 - **Press Return key.**
-

The EPROMS are erased and overwritten with the new MEMOSKOP image memory software.

- Wait until the process is completed.
- Switch the system off and on again.
- The existing licenses and parameters have to be loaded.
To do this, proceed as described in the section "MEMOSKOP CX200 Restore".

MEMOSKOP CX200 Backup

NOTE

With MEMOSKOP CX200 Backup all parameters as well as the existing licenses are backed up.

As with other Memoskop C types, a new backup file for the parameters is created with each backup; the file extension is automatically incremented.

Example: original parameter file name: "Parameter.000"

At the next backup a new file is created named "Parameter.001".

After the MEMOSKOP CX200 parameters have been changed, they should be saved on the MEMOSKOP CX200 Backup CD-ROM and then filed in the log book or system manual.

- Start the Technical Setup (CTRL + T)

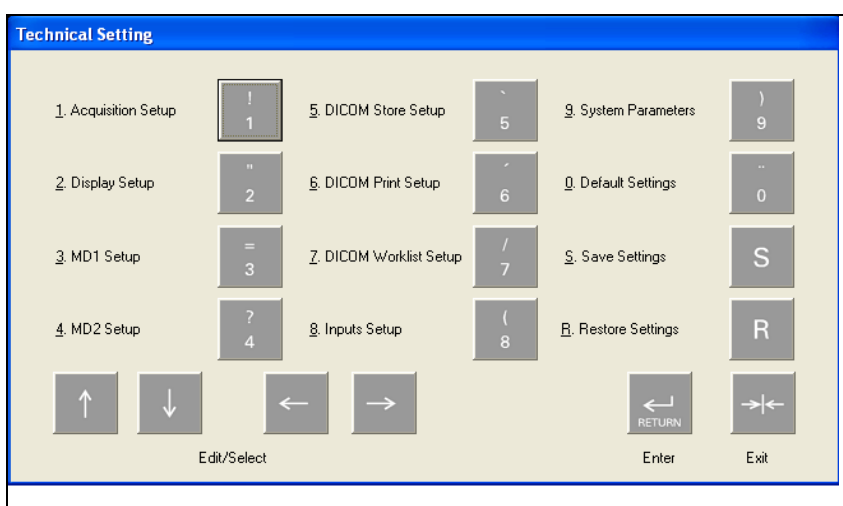


Fig. 1 Technical Setup Main Menu

- Remove the MEMOSKOP CX200 Backup CD-R from the log book or system manual.
- Insert the CD-R into the CD drive of the Memoskop CX200.
- Select "Save Settings" ("S" key) from the main menu of Technical Setup.
- Follow the menu guidance on the Memoskop.
- After you save the licenses and parameters remove the CD-R from the CD drive again.
- Close Technical Setup.
- Place the CD-R back into the log book.

MEMOSKOP CX200 Restore

After replacement of the MEMOSKOP CX200 or loss of data, the MEMOSKOP CX200 parameters can be reloaded from the CD-R.

- Start the Technical Setup (CTRL + T)

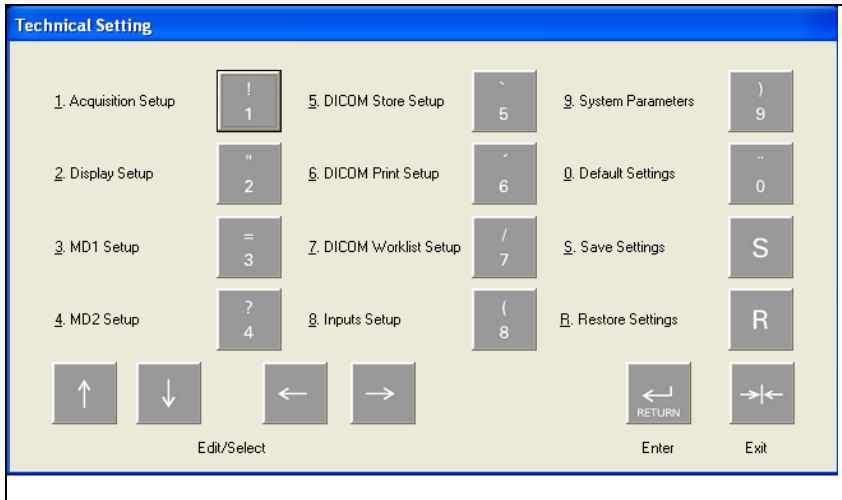


Fig. 2 Technical Setup Main Menu

- Remove the MEMOSKOP CX200 Backup CD-R from the log book or system manual.
- Insert the CD-R into the CD drive of the Memoskop CX200.
- Select "Restore Settings" ("R" key) from the main menu of Technical Setup.
- Follow the menu guidance on the Memoskop.
- Normally, the last backup file should be selected and transferred from the CD-R to the image memory.
- After the licenses and parameters have been loaded, the message "License file and system settings restored" is displayed.
- Remove the CD-R from the drive.
- Place the CD-R back into the log book.
- Close the Technical Setup and switch the system off and on again two times.

NOTE

The first time the system is switched off and on the corresponding registry entries are updated. After the second switching off and on the entries are correctly accepted by the system.

- Wait for the system to boot.
- Check the functions of the MEMOSKOP CX200.

Loading MEMOSKOP CX200 licenses

WARNING

Loss of all patient images

When the licenses
"CX200 2000 Images" and/or
"CX200 5000 Images + DSA"
are subsequently loaded for the first time, the image database has
to be newly created.

All the patient images stored in Memoskop CX200 will be lost!

Before any additional licenses
"CX200 2000 Images" and/or
"CX200 5000 Images + DSA"
are subsequently loaded for the first time, inform the customer
that all patient images will be lost. If necessary, print out the
patient images that are still needed, save them to CD-R or send
them to the DICOM archive via the DICOM function.

NOTE

Without valid licenses, the MEMOSKOP CX200 runs only in mini-
mal mode. Only fluoroscopy mode can be selected, no images
can be saved to hard disk and the network functions (DICOM) are
blocked.

NOTE

If the customer buys licenses subsequently, all previous licenses
are also present on the new license CD. For this reason, only the
most current license needs to be loaded.

NOTE

As a rule, the existing licenses are stored and present on the
MEMOSKOP CX200 Backup CD-R along with the backed up
parameters.

If the MEMOSKOP CX200 Backup CD-R is missing or is no longer
readable, then the existing licenses have to be loaded from the
original license CD-R.

Afterwards, a new, writeable CD-R must be inserted into the CD
drive and both the licenses and the parameters saved.
The CD-R must be labeled "SIREMOBIL Compact L", the material
number and serial number of the system, the date and initials
must be included, and it must be filed in the log book.

- Start the Technical Setup (CTRL + T)

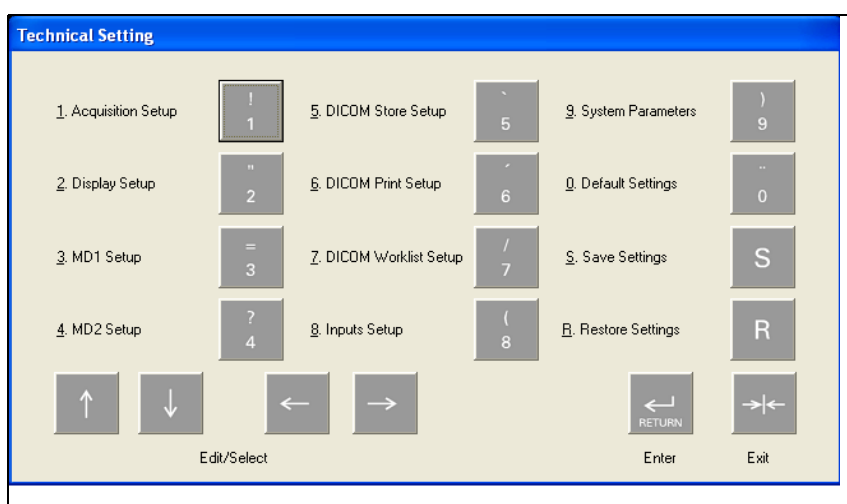


Fig. 3 Technical Setup Main Menu

- Insert the most current license CD into the CD drive of the Memoskop CX200.
- Select "Restore Settings" ("R" key) from the main menu of Technical Setup.
- An empty window will be displayed.
- Press the Return key.
- The license file on the CD will be read and stored in the MEMOSKOP CX200.
- After the licenses are successfully loaded, the following message will be displayed: "License file restored".
- Remove the CD-R from the drive.
- File the CD-R in the log book again.
- Close the Technical Setup and switch the system off and on again two times.

NOTE

The first time the system is switched off and on the corresponding registry entries are updated. After the second switching off and on the entries are correctly accepted by the system.

- Wait for the system to boot.
- Using the MEMOSKOP CX200 Backup function, save the loaded licenses to the backup CD-R.
See the section "MEMOSKOP CX200 Backup"
- Check the functions of the MEMOSKOP CX200.
- When you load new options (e.g. DICOM nodes), configure them and check the functions.

"CX200 2000 Images" license

WARNING

Loss of all patient images

When the licenses
"CX200 2000 Images" and/or
"CX200 5000 Images + DSA"
are subsequently loaded for the first time, the image database has
to be newly created.

All the patient images stored in Memoskop CX200 will be lost!

**Before any additional licenses
"CX200 2000 Images" and/or
"CX200 5000 Images + DSA"
are subsequently loaded for the first time, inform the customer
that all patient images will be lost. If necessary, print out the
patient images that are still needed, save them to CD-R or send
them to the DICOM archive via the DICOM function.**

Loading the license: See section "Loading MEMOSKOP CX200 licenses"

- Check the image memory functions.

"CX200 5000 Images + DSA" license

WARNING

Loss of all patient images

When the licenses
"CX200 2000 Images" and/or
"CX200 5000 Images + DSA"
are subsequently loaded for the first time, the image database has
to be newly created.

All the patient images stored in Memoskop CX200 will be lost!

**Before any additional licenses
"CX200 2000 Images" and/or
"CX200 5000 Images + DSA"
are subsequently loaded for the first time, inform the customer
that all patient images will be lost. If necessary, print out the
patient images that are still needed, save them to CD-R or send
them to the DICOM archive via the DICOM function.**

Loading the license: See section "Loading MEMOSKOP CX200 licenses"

- Carry out the IQ-Quick test completely.

"CX200 DICOM" license

Loading the license: See section "Loading MEMOSKOP CX200 licenses"

- Check the basic functions of the MEMOSKOP CX200.
- Perform the DICOM functions acc. to the Startup Instructions for SIREMOBIL Compact L, print number SPR2-130.815.02....
- Afterwards, check the DICOM functionality.
- Start the patient directory with the "All Pat" key and select a patient.
- Send the patient imagers to every installed DICOM node.

"CX200 Burning" license

Loading the license: See section "Loading MEMOSKOP CX200 licenses"

- Check the basic functions of the MEMOSKOP CX200.
- Check the burner function.
- Insert an empty, unused CD-R into the CD drive.
- Start the patient directory with the "All Pat" key and select a patient.
- Transfer the patient images to the CD-R by pressing the "E" key (Export Patient).

NOTE

When patient images are burned by pressing the "All Pat" key and selecting a patient, all images stored under the selected patient are written to the CD-R. The CD-R is closed after burning (not a multi-session CD).

For this reason, the CD-R used must be new and empty. A CD-R that has already been used as a multi-session CD cannot be used.

In contrast, when patient images are burned from the User Setup in the "External Storage (CD)" menu, the CD-R is set up and written as a multi-session CD.

- After the burning process is complete, remove the CD-R from the CD drive.
- Insert the CD-R into the CD drive of a service PC and use a DICOM viewer to check the images.

NOTE

The DICOM Viewer software is written to every CD-R.

If no DICOM Viewer software is installed on your service PC, you can use the DICOM Viewer software from the burned CD-R.

The DICOM Viewer software can be started from the CD-R.

It can also be copied to the service PC and started from the hard disk drive of the service PC.

Generator, kV offset adjustment

NOTE

The kV offset adjustment has to be followed by the generator adjustment (filament circuit learning program).
Always perform the kV offset adjustment prior to beginning the generator adjustment.

- Connect the service PC to the serial interface on board D1.
- Start the service program.
- Select the Diagnostic menu.
- Select the Monitoring menu.
- Select "KV offset adjustment in the "Group 1" Combo box.
- Click on "Update Stop".

 WARNING

X-ray radiation!
See Chapter 1, Safety Information.
Protect yourself against radiation exposure. Wear a lead apron.



- After the "Start fluoro" message in the ACTIONS line, press the radiation release button on the SIREMOBIL Compact L hand switch.

NOTE

After the "KV error break" message in the STATUS line, click on "Update Stop". Wait for approx. 10 seconds.
Click on "Update Start" again. After the "Start fluoro" message in the ACTIONS line, press the radiation release button on the SIREMOBIL Compact L hand switch. Refer to the text which follows for additional procedures.

- Continue to hold the radiation release button as long as the message "Continue fluoro" is displayed in the ACTIONS line.
- Release the radiation release button as soon as the message "Stop monitoring" appears in the ACTIONS line.
- Click on "Update Stop".
- Perform the generator adjustment (filament circuit learning program).

Generator adjustment (filament circuit learning program)

NOTE

The kV offset adjustment must be performed prior to starting the generator adjustment.

NOTE

If an error occurs during the generator adjustment, switch OFF the SIREMOBIL Compact L and perform the kV offset and generator adjustments again.

NOTE

As soon as the generator adjustment is started, press the radiation release button on the hand switch until the "Stop monitoring" message appears in the ACTIONS line. If you deactivate radiation too soon, the generator adjustment must be completely repeated. Exception: You can briefly stop pressing the radiation release button (less than 30 seconds) during the warmup phase (warmup displays in the STATUS line on the service PC) of the SIREPHOS. The generator adjustment continues when the radiation release button is pressed again.

- Connect the service PC to the serial interface on board D1.
- Start the service program.
- Select the Diagnostic menu.
- Select the Monitoring menu.
- In the "Group 1" Combo box, select "Generator adjustment".
- Click on "Update Start".

⚠ WARNING

X-ray radiation!
See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.



- After the "Start fluoro" message in the ACTIONS line, press the radiation release button on the SIREMOBIL Compact L hand switch.
- Continue to hold the radiation release button as long as the message "Continue fluoro" is displayed in the ACTIONS line.
- "Warmup" appears in the STATUS line, the Sirephos is warming up. After approx. 8 minutes, the message "learning pushfactor" will appear in the STATUS line.
- A maximum of 15 exposures will be released automatically.
- The message "Learning done" appears in the STATUS line after the generator adjustment has been successfully completed.
- The "Stop monitoring" message appears in the ACTIONS line.
- Activate the radiation release button.
- Click on "Update Stop".
- Switch the SIREMOBIL Compact L OFF and back ON again.

Checking the generator adjustment

**WARNING**

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

- With the system on, connect the service PC to the SIREMOBIL Compact L.
- Select "Test..." in the Diagnostic menu.
- Select cassette simulation in "Function Groups".
- Select cassette switch ON in "Available Functions".
The SIREMOBIL Compact L is now in direct exposure mode.
- Select 81 kV with the kV+ / kV- keys.
- Select 8 mAs with the mAs+ / mAs- keys.
- Connect oscilloscope channel 1 to D1.X46, ground at 0V.
Set the sensitivity to 1 V / Div.
- Connect oscilloscope channel 2 to D1.X48, ground at 0 V.
Set the sensitivity to 2.5 V / Div.
- Set the time to 25 ms / Div.
- Set the oscilloscope to storage mode.
- Release an exposure with the hand switch and store the oscillogram with the exposure.
- Evaluate the stored oscillograms.
The tube current must reach the tolerance range of $13 \text{ mA} \pm 1.5 \text{ mA}$ in the time of 3 ms and may not leave this range for the next 6 ms (the tube current may not run above 14.5 mA within the first 6 ms).
Refer also to oscillograms in Fig. 1 / Fig. 1a and Fig. 1b.
- Select "Cassette switch off" on the service PC in "Available Functions".
Direct exposure mode is cancelled.
- If the unit exceeds the tolerance range, the generator adjustment must be repeated.



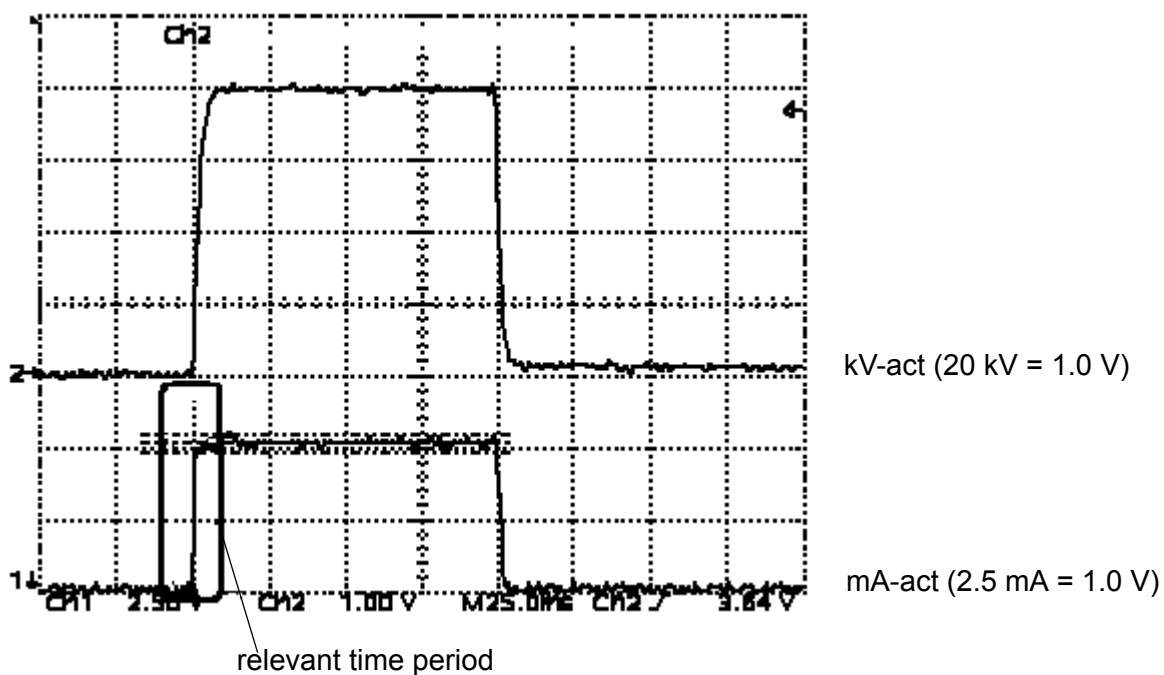


Fig. 1

Error examples:

Tube current exceeds the upper limit
- preset filament current too high

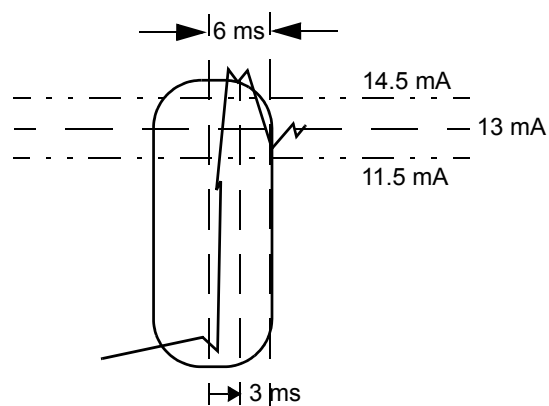


Fig. 1a

Tube current exceeds the lower limit
- preset filament current too low

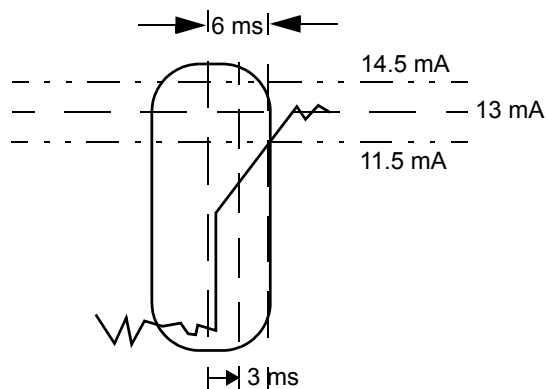


Fig. 1b

Dose rate adjustment



WARNING

X-ray radiation!
See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

Prerequisites

- The "Adjustment mode" parameter in the "Doserate adjustment" parameter group has been programmed to "semi-automatic".

Preliminary steps

- Switch on SIREMOBIL Compact L.
- Connect the service PC to the serial interface of the SIREMOBIL Compact L.
- Start the service program.
- Select the "Diagnostics..." menu.
- Select the "Monitoring..." menu.
- Select the "Dose rate adjustment" menu from the Combo Box "Group 1".
- Click on the button "UPDATE START".
- The following is displayed on the service PC:

AUTO REGULATION	indicates the current status of the automatic adjustment. (active / not active / manual / done)
BRIGHTNESS DEVIATION	shows the difference in the actual brightness value minus the nominal brightness value.
CONTROL CURVE	shows the currently selected fluoro curve (default: S2, antiiso-watt 5 mA)
ADJUSTMENT	shows the operating control mode. (Generator / Camera Iris / Stop)
I.I. ZOOM STATUS	shows the current I.I. format (survey / zoom)
DOSERATE	shows the dose rate selected. (LOW / MID / HIGH)
TV-IRIS NOMINAL VALUE	shows the stored or nominal TV-iris value from the learning phase. Note: An offset value is added to this value. For this reason, the TV-IRIS NOMINAL VALUE and TV-IRIS ACTUAL VALUE differ despite the correct adjustment (BRIGHTNESS DEVIATION 0 ± 3).
TV-IRIS ACTUAL VALUE	shows the actual TV iris value.

- Insert 25 mm Al and 2.1 mm Cu at the radiation exit port of the SIREPHOS.
- The grid remains on the I.I.

Correction factors

- Grid correction factor 23 cm (9") I.I. and 17 cm (7") I.I.:1.5
- Dose measurement chamber correction factor for Dali and Nomex:1.06
- Multiply the Dose rate values to be set at the I.I. input screen with the Grid correction factor and - if needed - with the Dose measurement chamber correction factor.

Dose rate to be set at the I.I. input screen:

I.I. type	I.I. format	Dose rate		
		LOW	MID	HIGH
17 cm (7") I.I.	Survey	132 nGy/s	220 nGy/s	440 nGy/s
17 cm (7") I.I.	Zoom	187 nGy/s *	311 nGy/s	622 nGy/s
23 cm (9") I.I.	Survey	111 nGy/s	185 nGy/s	370 nGy/s
23 cm (9") I.I.	Zoom	157 nGy/s *	262 nGy/s	523 nGy/s

***NOTE**

For LOW dose rate levels in zoom format:

Due to the maximum possible opening of the TV iris, deviating dose rate values are acceptable, if the dose rate level is set to LOW in zoom format.

When the dose rate level is set to LOW in the zoom format, the minimum position value (= minimum opening) of the TV iris may be the same value as in the survey format. (Opening of TV iris collimator in zoom format $\geq$ opening of TV iris collimator in survey format).

When the dose rate level is set to LOW in zoom format, the display "BRIGHTNESS DEVIATION" may show a value greater than ± 3 .

If the value shown in "BRIGHTNESS DEVIATION" is greater than ± 3 , you must read out and evaluate the position values of the TV iris collimator when the dose rate level is set to LOW in both the zoom and survey formats:

(Service PC, Menu Adjustments... / Parameters.../ Doserate adjustment, Parameter LOW - Zoom format pos. and Parameter LOW Full format pos.)

Acceptable parameter values are:

LOW - Zoom format pos. $\geq$ LOW - Full format pos.

Unacceptable parameter values are:

LOW - Zoom format pos. $<$ LOW - Full format pos.

Setting the dose rate for survey format

- Select the I.I. survey format (refer to the I.I. ZOOM STATUS).
- Center the dose measurement chamber on the I.I. input screen and attach.
- Use the  key to select the dose rate (LOW / MID / HIGH, shown in the "DOSERATE" line).



- Apply fluoro briefly until the generator finishes regulating the automatic fluoro adjustment.
- Select KV STOP at the system operating console.
- Switch on fluoro.
- Set the dose rate with the [+kV] and [-kV] keys.
(Dose rate * grid correction factor (* measurement chamber correction factor - if needed)).
- The resulting KV value should be between 70 to 80kV . If necessary, change the prefiltration and set the dose rate again using keys [+kV] or [-kV]. Refer to the table.
- Switch off fluoro.
- Remove the dose measurement chamber from the I.I. input screen.



- Switch on fluoro.
- Press the [>0<] at the system operating console. This starts the automatic adjustment procedure for the TV- iris collimator.
- Wait until the message "done" appears in the "AUTO REGULATION" line.
- The "BRIGHTNESS DEVIATION" value is shown in the "BRIGHTNESS DEVIATION" line and should be 0 ± 3 .
- Switch off fluoro.

Setting the dose rate for zoom format

refer also to notice on previous page *.

- KV-STOP remains selected.
- Center the dose measurement chamber on the I.I. input screen and attach.
- Select the I.I. zoom format (refer to "I.I. ZOOM STATUS"). The KV values remain the same. The mA values, however, are automatically increased by a factor of 1.41.
- Use the [mA+] and [mA-] keys to set the dose rate for the zoom format
(Dose rate * grid correction factor (* measurement chamber correction factor - if needed)).
- Press the [>0<] key at the system operating console. This starts the automatic adjustment procedure for the TV-iris collimator.
- Wait until the message "done" appears in the "AUTO REGULATION" line.
- The "BRIGHTNESS DEVIATION" value is shown in the "BRIGHTNESS DEVIATION" line and should be 0 ± 3 , refer also to notice on previous page *.
- Switch off fluoro.

- Select the next level of dose rate (LOW / MID / HIGH) and repeat the dose rate setting for the survey and zoom format for this level.

Concluding steps

- After setting all dose rates for the survey and zoom formats, click "Stop Update" and wait until "CAL" disappears from the 7 segment indicator to the right on the operating console. The TV- iris collimator values are stored to the EE-PROM of the host.
- Press ESC at the service PC to return to the main menu.
- Select the "Data, Backup..." menu.
- Click "Parameter" in the backup window.
 - Then click "Backup".
- Enter "dose rate set" under "Remarks for Parameter".
- Then click "OK". The parameters are stored to disk.
- You can now exit from the service program.

Checking the dose rate in automatic mode

NOTE

Checking the dose rate in zoom format with a dose rate measurement chamber that is not completely irradiated may lead to incorrect measurements.



- Center and reattach the dose measurement chamber to the I.I. input screen.
- Set the kV-mA curve HC1 (3 mA plateau curve). If necessary, temporarily program the HC1 curve.
- During automatic mode (kV STOP is off), check the dose rate for dose rate levels LOW / MID / HIGH for the survey and zoom format. Take into account the correction factors for the grid and the dose measurement chamber. If necessary, temporarily change the dose rate levels and kV-mA curves.
Tolerance margin for the dose rates: $\pm 15\%$.
- Set the kV-mA curve HC2 (5 mA plateau curve). If necessary, temporarily program the HC2 curve.



- During automatic mode (kV STOP is off), check the dose rate for dose rate levels LOW / MID / HIGH for the survey and zoom format. Take into account the correction factors for the grid and the dose measurement chamber. If necessary, temporarily change the dose rate levels and kV-mA curves.
Tolerance margin for the dose rates: $\pm 15\%$.

Setting the maximum skin dose rate

WARNING

X-ray radiation!
See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

NOTE

Setting the maximum skin dose rate is necessary only for countries where DHHS regulations apply.

Prerequisites

- You must program one of the FL curves S2, HC2 or IODINE.
- The FL curves S2, HC2 or IODINE should be used for the following adjustment.
- The X-ray tube cover must be installed.
- Use the dose ionization chamber of the dose measurement device to measure dose rates greater than 10 R/min.
- If you are using an area dose product measurement device, mount the dose measurement chamber above the radiation exit port of the SIREPHOS.

Preparations

- Attach the dose ionization chamber at a distance of 30 cm from the I.I. housing (Fig. 2).
- Select one of the FL curves S2 / HC2 or IODINE according to the programming. (Push-key)
- Briefly release fluoro.
- Select kV stop mode and enter 110 kV (5 mA).

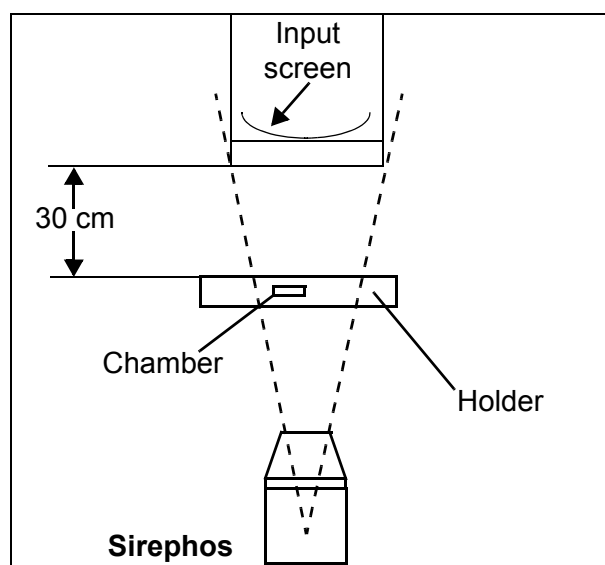


Fig. 2

NOTE

If the maximum tube current was already reduced, the mA value displayed at 110 kV should be recorded and used for the calculation. The maximum skin dose rate to be set should equal 9 R/min.

Measurement

- Switch on fluoroscopy.
- Read and record the value displayed on the dose rate meter.
- If the value measured exceeds 9 R/min, the maximum tube current must be reduced.
If the value measured is less than 9 R/min, the tube current does not need to be reduced.
- Switch fluoroscopy off.
- Calculate the maximum tube current.

$$\frac{\text{tube current displayed at 110kV in mA} * 9 \text{ R/min}}{\text{measured dose rate value in R/min}} = \text{tube current to be programmed in mA}$$

- Multiply the tube current to be programmed by 10 , since entry on the service PC must be made in 1/10mA. Round off the value to the nearest whole number.

Example: Tube current displayed at 110kV: 5mA

Maximum skin dose rate: 9R/min

Measured dose rate value : 10.2 R/min.

$$\frac{5 \text{ (mA)} * 9 \text{ (R/min)}}{10.2 \text{ (R/min)}} = 4.41 \text{ (mA)} \quad \text{Rounded to the nearest whole number: 44}$$

The value to be programmed is 44

Programming

- Connect the service PC to the serial interface of board D1.
- Select the "Adjustment, Parameters" menu.
- In the Combo box "Parameter Groups" select "Limitation of skin dose rate (FL)" .
- Click on "Get from unit" .
- Enter the value to be programmed in "Value" .
- Click on "Set Value" .
- Select "Put to unit" . Read the menu guide on the service PC.
- Select "Save to file" .
- The value to be programmed has been transferred to the SIREMOBIL Compact L and temporarily stored to the disk.

NOTE

**You must exit the service program with "Logoff" and "Quit".
Only then will the modified parameters be stored on the floppy disk as a new file.**

Checking

- After programming, check the maximum skin dose rate again.

Collimator, X-Iris

NOTE

Because of the mechanical hysteresis of the semi-transparent slot diaphragm, open the collimator blades to maximum aperture, prior to adjusting the radiation iris.

WARNING

X-ray radiation!
See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

Prerequisites

- Attach the center cross in the center of the image intensifier input screen.
- Connect the service PC to the serial interface on board D1.
- Start the service program.

Adjustments

- Select the "Adjustment, Calibration" menu.
- Answer the query with "yes".
- Select "X-Iris" in the "Function Groups" combo box.
- In the window "Available Functions:" select "1. Init (Limits Off / Autosearch)" and click on Execute.
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "No".
- The X-Iris can now be completely opened and closed with the X-Iris keys.



- Select I.I. survey format.
- During fluoroscopy, adjust the X-Iris by opening and closing it with the X-Iris keys so that the collimator blades are still visible along the edge of the I.I.
- Stop fluoroscopy.
- Select "2. II. - Full Format Position" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "No".
- Switch to zoom format.



- During fluoroscopy, adjust the X-Iris by opening and closing the X-Iris keys so that the collimator blades are still visible along the edge of the I.I.
- Stop fluoroscopy.
- Select "3. II. - Zoom Format Position" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "No".
- Open the X-Iris completely.
- Select "4. CEX Position" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "No".
- Close the X-Iris completely.



- Release fluoroscopy. The X-Iris must close between 4 - 4.5 cm.
- Stop fluoroscopy.
- Select "5. CLOSED POSITION" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "NO".
- Select "8. Init Off & Store Positions" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit," click "Yes".
- Switch the SIREMOBIL Compact L OFF and ON.



- Check the X-Iris again in survey format and zoom format. The collimator blades must still be visible on the edge of the image. If necessary, repeat the adjustment.
- Stop fluoroscopy.

Concluding steps

- Return to the main menu on the service PC with the ESC key.
- Select the Data, Backup... menu.
- Select Parameter in the backup window.
- Click on "Backup". At "Remarks for Parameter" enter "X-Iris set".

- Click on "OK" . The new position values for the collimator will be stored on the disk.
- Return to the main menu with the ESC key.

Collimator, slot diaphragm

Prerequisites

- Camera rotation has been adjusted correctly.
- Image reversal functions are disabled.
- The "SLOT DIAPHRAGM," "TYPE OF DIAPHRAGM" parameter has been programmed for "DISPLAY YES".

Adjustment

- Connect the service PC to the serial service interface.
- Start the service program.
- Select the Adjustment, Calibrations...menu.
- Respond to the query with yes.
- In the Combo box "Function Groups:" select "Slot Diaphragm".
- In the window "Available Functions:" select "Disable circle mask" and click "Execute". The circle mask of the Memoskop is switched off.
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No" .
- In the window "Available Functions:" select "Init" and the "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No" .
- The mechanical limits are checked and the position values are automatically stored.
- Camera rotation is automatically moved to the 0 degree position.
- The X-Iris is opened to max.aperture.
- Switch off Zoom .
- Attach a centering cross or equivalent object to the I.I. for evaluating the position of the fluoro image



WARNING

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.



- Switch on fluoro
- Move the slot diaphragm to the 0 degree position using the keys for rotating the slot diaphragm. The blades should be in the vertical on the monitor screen.
- Switch off fluoro.
- In the window "Available Functions:" select "0 DEGREE POSITION" and click "Execute".



- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No" .
- Switch on fluoro.
- Open the slot diaphragm to where the blades begin to disappear at the edge of the image.
- Switch off fluoro.
- In the window "Available Functions:" select "FULL FORMAT POSITION" and click "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No".



- Select the zoom format.
- Switch on fluoro.
- Open the slot diaphragm to where the blades begin to disappear at the edge of the image.
- Switch off fluoro.
- In the window "Available Functions:" select "ZOOM FORMAT POSITION" and click "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No" .
- In the window "Available Functions:" select "Enable circle mask" and click "Execute"
- Respond to the query "Do you want to reset the unit" by clicking "No" .
- In the window "Available Functions:" select "INIT OFF & STORE POSITION" and click "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "Yes". The adjustment values are stored.

Concluding steps

- Switch off the system and switch it back on again.
- Return to the main menu by pressing ESC at the service PC.
- Select the "Data, Backup..." menu.
- Click "parameter" in the Backup window.
- Then click "Backup". Enter "slot diaphragm adjusted" under "Remarks for Parameter".
- Then click "OK" . The new position values are stored to disk.
- You can now exit from the service program.

Collimator displays on the monitor

Prerequisites

- Camera rotation, collimators for X-Iris and slot diaphragm have been set correctly.

**WARNING****X-ray radiation!****See Chapter 1, Safety Information.****Protect yourself against radiation exposure. Wear a lead apron.**

Collimator display, X-Iris

- Connect the service PC to the serial interface of the SIREMOBIL.
- Start the service program.
- Select the "Adjustment, Calibrations..." menu.
- Respond to the query with "Yes".
- Select "Screen Display Collimator" in the "Function Groups:" combo box.

Start adjustment

- In the "Available Functions:" window select "Init" and click on "Execute". The X-Iris is automatically opened to full format and the slot diaphragm is opened to maximum aperture.

Full format, X-Iris open



- Zoom must be disabled.
- Release fluoro and wait until generator has performed automatic adjustment.
- Switch fluoro off. The X-Iris is displayed on the monitor.
- Use the keys for opening and closing the X-Iris to set the diameter of the superimposed circle to the size of the X-iris.
- In the "Available Functions:" window select "Open Pos - II. Full Format" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit", click on "No". The X-Iris is automatically closed to the smallest format.

Full format, X-Iris closed



- Briefly release fluoro. The X-Iris is displayed on the monitor.
- Use the keys for opening and closing the X-Iris to set the diameter of the superimposed circle to the size of the X-iris.
- In the "Available Functions:" window select "Close Pos - II. Full Format" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit", click on "No".

- The X-Iris remains in the minimum position.
- Zoom format is automatically selected.

Zoom format, X-Iris closed

- Briefly release fluoro. The X-Iris is displayed on the monitor.
- Use the keys for opening and closing the X-Iris to set the diameter of the superimposed circle to the size of the X-Iris.
- In the "Available Functions:" window select "Close Pos - II. Zoom Format" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit" click on "No".
- The X-Iris is opened automatically.
- Zoom format remains selected.

Zoom format, X-Iris open

- Briefly release fluoro. The X-Iris is displayed on the monitor.
- Use the keys for opening and closing the X-Iris to set the diameter of the superimposed circle to the size of the X-Iris.
- In the "Available Functions:" window select "Open Pos - II. Zoom Format" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit", click on "No".

Save values and end adjustment

- In the "Available Functions:" window select "INIT OFF & STORE VALUES" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the unit", click on "Yes".

Concluding tasks

Before ending the service program, save the new parameter values to disk (Service PC, Data menu, Backup).

Slot diaphragm**NOTE**

Use the lowest KV values possible to ensure optimal detection of the front edges of the slot diaphragm blades.

Prerequisites

- The setting of the camera rotation is correctly adjusted and is in the 0° position.
- Connect the service PC to the serial interface of the SIREMOBIL.
- Start the service program.
- Select the "Adjustments, Calibrations..." menu. Answer the query with "Yes".
- Select "SCREEN DISPLAY SLOT DIAPHRAGM" in the "Function Groups:" combo box.

Disable circle mask

- Switch off zoom.
- In the "Available Functions:" window, select "DISABLE CIRCLE MASK" and click on "Execute". Close the status window by clicking on the OK button.
For the query "Do you want to reset the Unit", click on "No".

Start adjustment

- In the "Available Functions:" window select "INIT" and click on "Execute". Close the status window by clicking on the OK button.
For the query "Do you want to reset the Unit", click on "No".

Full format, slot diaphragm open

- Move the camera into the 0 degree position.
The X-Iris opens to survey format. To open it further, use the keys for opening the X-Iris.
The slot diaphragm is opened automatically.
- Apply fluoro briefly.
- Open and close the slot diaphragm display via the keys.
- Align the lines shown on the monitor with the front edges of the slot diaphragm blades.
- In the window "Available Functions:" select "Slot Diaphragm Open Pos - I.I. Full Format" and click "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No". The slot diaphragm is closed automatically.

**Full format, slot diaphragm closed**

- Apply fluoro briefly.
- Open and close the slot diaphragm display via the keys.
- Align the lines shown on the monitor with the front edges of the slot diaphragm blades.
- In the window "Available Functions:" select "Slot Diaphragm Close Pos - I.I. Full Format" and click "Execute".
- Close the status window by clicking on the OK button.



- Respond to the query "Do you want to reset the unit" by clicking "No". The slot diaphragm remains closed.

Zoom format, slot diaphragm closed

- The zoom format is selected automatically.
- Apply fluoro briefly.
- Open and close the slot diaphragm display via the keys.
- Align the lines shown on the monitor with the front edges of the slot diaphragm blades.
- In the window "Available Functions:" select "Slot Diaphragm Close Pos - I.I. Zoom Format" and click "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No". The slot diaphragm opens automatically (zoom format).

**Zoom format, slot diaphragm open**

- Apply fluoro briefly.
- Open and close the slot diaphragm display via the keys.
- Align the lines shown on the monitor with the front edges of the slot diaphragm blades.
- In the window "Available Functions:" select "Slot Diaphragm Open Pos - I.I. Zoom Format" and click "Execute".
- Close the status window by clicking on the OK button.
- Respond to the query "Do you want to reset the unit" by clicking "No".

**Enable circle mask**

- In the "Available Functions:" window select "Enable Circle Mask" and click on "Execute".
Close the status window by clicking on the OK button.
For the query "Do you want to reset the unit", click on "No".

Save values and end adjustment

- In the "Available Functions:" window select "INIT OFF & STORE VALUES" and click on "Execute". Close the status window by clicking on the "OK" button.
For the query "Do you want to reset the Unit", click on "Yes".

Concluding tasks

- Before exiting the service program, save the new parameter values to disk (Service PC, Data menu, Backup).

Correction of the 0° position of the slot diaphragm display

NOTE

Correct only if the slot diaphragms are shown at an angle of rotation different from that displayed on the monitor. A correction of $\pm 10^\circ$ is possible. Camera rotation and slot diaphragm have to be set correctly.

The service PC is connected to the serial interface of the SIREMOBIL Compact L.

The service program is started.

- Select the "Adjustments," "Parameter" menu at the service PC.
- Select "Screen display Slot diaphragm" in the Combo box.
- Click "Get from Unit".
- Select "Rotation 0 degree position".
- The parameter in the "Value Actual" field can be changed according to the minimum and maximum values.
- Then click "Set Value".
- Click "Put to Unit".
- After the SIREMOBIL Compact L has booted, compare the 0° position of the slot diaphragm blades to the display on the monitor. If necessary, repeat the programming.
- Click "Save to file" .
- Leave the service program with "Logoff" and "Quit" to save the parameters as a new file to disk.



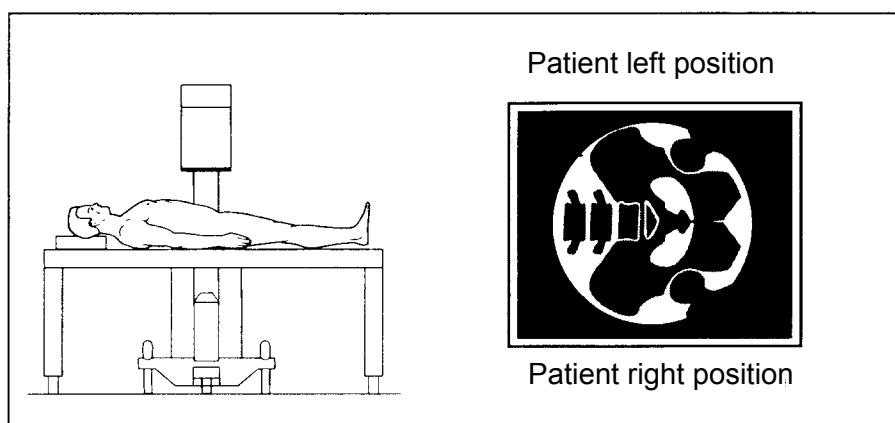


Fig. 3

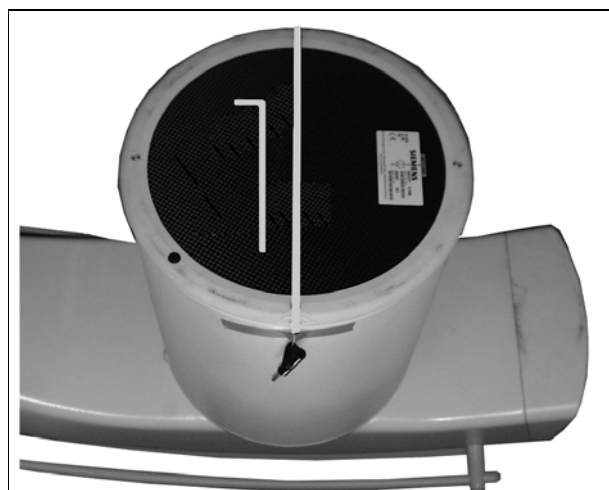


Fig. 4

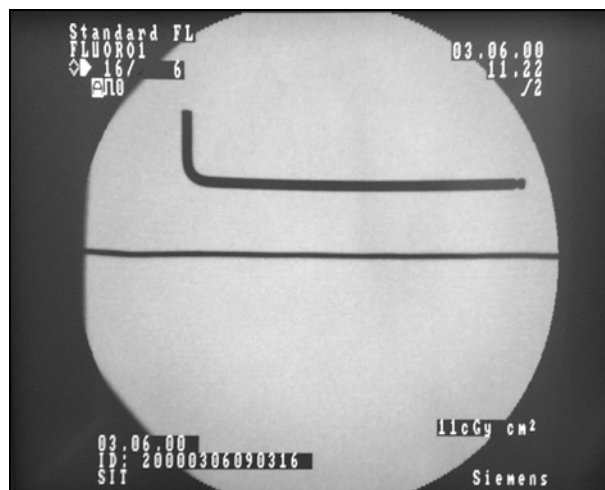


Fig. 5

Camera rotation

⚠ WARNING

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

NOTE

The keys for horizontal and vertical image reversal must be off prior to adjusting camera rotation. Camera rotation should be set in the 0° position. Fig. 3, Fig. 4 and Fig. 5 show the 0° position.

NOTE

With the right camera rotation key (the arrow on the key is pointing clockwise), the marker on the monitor will rotate clockwise. The image contents will rotate counterclockwise.

With the left camera rotation key (the arrow on the key is pointing counterclockwise), the marker superimposed on the monitor will rotate counterclockwise. The image contents will rotate clockwise.

- Connect the service PC to the serial interface on board D1.
- Start the service program.
- Select the Adjustment, Calibrations menu.
- Answer the query "yes".
- In the Combo box "Function Groups:" select "Camera Rotation" .
- In the window "Available Functions:" select "1. Init (Disable Limits)" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the Unit," click "No".
- Attach the center cross or equivalent to the image intensifier.



- Start fluoro and rotate the camera to the +180° position (with the counterclockwise camera rotation key). The image contents should rotate counterclockwise.
- Stop fluoro. In the window "Available Functions:," select "2. +180 Degree Position" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the Unit," click "No".



- Start fluoro and set camera rotation to the 0° position. The image (left/right / up/down) corresponds to Fig. 3.
- Stop fluoro, in the window "Available Functions:," select "3. 0 Degree Position" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the Unit," click "No".



- Start fluoro and rotate the camera to the -180° position (with the counterclockwise camera rotation key). The image contents will rotate clockwise.
- Stop fluoro, in the window "Available Functions:," select "4. -180 Degree Position" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the Unit," click "No".
- In the window "Available Functions:," select "5. Init Off & Store Positions" and click on "Execute".
- Close the status window by clicking on the OK button.
- For the query "Do you want to reset the Unit", click "Yes".
- Return to the service program main menu with the ESC key.
- Select the Data, Backup... menu.
- Select Parameter in the Backup window.
- Click on "Backup".
- In "Remarks for Parameter", enter "camera rotation set".
- Click "OK". The new position values for camera rotation will be stored to the disk.



- Switch the SIREMOBIL Compact L OFF and ON again.
- Check the adjustments again. In the 0° position, the object image must correspond to the one in Fig. 3.
- If the system is used in combination with a navigation system, inform the customer that the accuracy of the navigation system needs to be checked.

Calibrating the area dose product measurement device

NOTE

This adjustment is used to calibrate the area dose product measurement device of the SIREMOBIL Compact L display.

Calculating the CONSTANT parameter ($Q_t * K_g$) = Tw

- Read and record the Tw value shown on the electronics unit of the area dose product measurement device.

Programming

- Connect the service PC to the serial interface on board D1.
- Start the service program.
- Select the Adjustment, Parameter menu.
- In the Combo box "Parameter Groups", select "Diammentor".
- Click on "Get from Unit".
- The Parameter "1. Diammentor Existing" must be on YES .
- Select parameter "2. Constant ($Q_t * K_g$)".
- In "Value Actual:" field, enter the parameter Tw.
- Click on "Set Value".
- Click on "Put to Unit" .
- Click on "Save to File".

NOTE

You must exit the service program with "Logoff" and "Quit" to store the modified parameters to disk as a new file.

Checking the programmed values

NOTE

Checking the programmed values will activate the self-test in the electronic system of the area dose product measurement device. This serves to recalibrate the electronic system of the area dose measurement device.

Prerequisites

The Tw value was checked and is already programmed. Refer to Programming.

- Connect the service PC to the serial interface of the SIREMOBIL.
- Start the service program.

- Select the Adjustment, Calibrations menu.
- Click "Yes" to answer the query.
- In the Combo box "Function Group:," select "Diamantor".
- In the window "Available Functions", select the line "Start Diamantor Test" and click on "Execute".
- Close the status window by clicking on the OK button.
- Respond the query "Do you want to reset the unit" by clicking "No".
- Press the -0- key (reset key for fluoroscopic time).
- The tested Tw value is displayed on the monitor of the SIREMOBIL Compact L.
- This value must match the programmed CONSTANT ($Q_t \cdot Kg$) value.
Tolerance: $\pm 5\%$.
- By pressing the -0- key (reset key for fluoroscopic time) the test is repeated and is displayed again on the monitor.
- The potentiometer at the area dose product measurement device can be used to adjust the test value to the calculated and programmed value ($Q_t \cdot Kg$).
- After the adjustment, select "Stop Diamantor Test" on the service PC and click on "Execute".
- Close the status window by clicking on the OK button.
- Respond the query "Do you want to reset the unit" by clicking "No".
- The test is ended.
- Check the accuracy of the area dose product measurement device. Refer to the next section.

Checking the accuracy of the area dose product measurement device



WARNING

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

Prerequisites

The calibration of the area dose product measurement device has already been performed.

Preparations

- Attach and center the center cross on the I.I. (Fig. 6).
- Select survey format.
- Select KV mA curve plateau HC1.
- Release fluoroscopy briefly, adjusting the iris on the radiation field to a format of approx. 15 cm. Do not make any further adjustments to the iris.
- Record the diameter (Fig. 8) of the octagonal area of the radiation field.



- Remove the center cross.
- Attach and center the small (1cm³) dose measurement chamber (DALI, NOMEX) or the semiconductor detector (DIADOS) of the dose measurement device onto the image intensifier (Fig. 7)
- Release fluoroscopy briefly..

NOTE

The radiation field must cover the entire area of the dose measurement chamber or semiconductor detector.



- Select kV STOP and enter 70 kV.

Dose measurement

- Press the >0< key twice to reset the area dose product on the SIREMOBIL monitor to 0.
- Reset the dose measurement device (DALI, NOMEX, DIADOS...) to 0 .
- Release fluoroscopy several seconds. The measured dose K_E should be high enough that the uppermost measurement range of the dose measurement device is utilized fully.
If necessary, reset the area dose product display on the Siremobil and the dose measurement device and repeat the measurement with a different fluoroscopic time.
- Record the measured dose.
- Record the area dose product displayed on the Siremobil monitor (FDPa).

Calculating the area dose product

- To calculate the measured area dose product:

$$(\text{measured area dose product FDPg}) = (\text{measured dose } K_E) * (\text{diameter})^2 * 0.829.$$

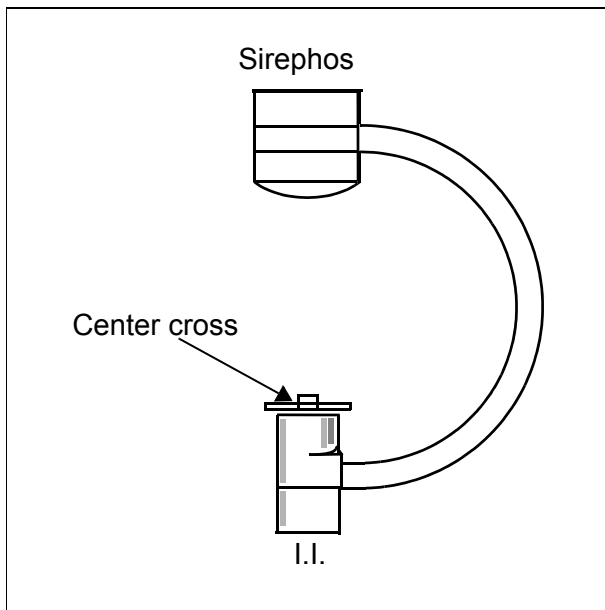


Fig. 6

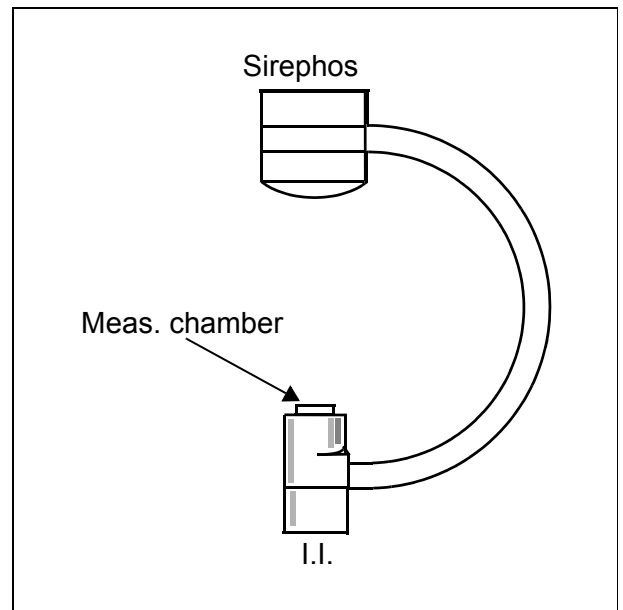


Fig. 7

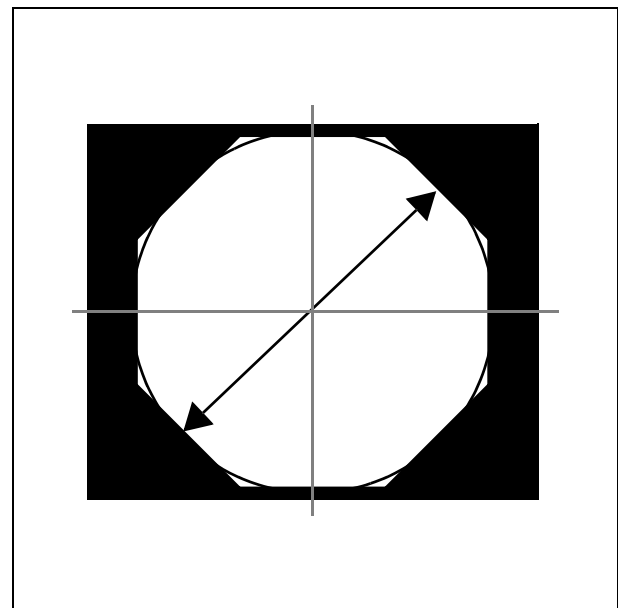


Fig. 8

Evaluation

Calculate the deviation between the measured area dose product and the displayed area-dose product:

The deviation must be < 0.3 .

$$\text{Deviation} = \frac{[(\text{displayed area dose product FDPa}) - (\text{measured area dose product FDPg})]}{(\text{measured area dose product FDPg})}$$

For deviations > 0.3 , the area dose product measurement device must be replaced.

Overview of SIREMOBIL Compact L parameters

Invoke the Moreinfo.hlp help file on the service PC for a short description of the parameters available on the SIREMOBIL Compact L.

NOTE

If parameters have been changed and saved in the "Adjustments, Parameter" menu with Save to file, you must exit the service program with "Logoff" and "Quit" to save the modified parameters to the diskette.

Overview of MEMOSKOP C / C-E / C-SUB parameters

User Setup

- The User Setup is invoked with the CTRL + U key combination.
- The available functions are described in the SIREMOBIL Compact L Operating Instructions.

Technical Setup

- The technical setup is invoked with the CTRL + T key combination.
- Enter the password and confirm with [RETURN]

The following functions can be invoked depending on the type of MEMOSKOP:

Function:	Comments:
Test pattern generation	Not for service, invoke the necessary test images on the service PC.
Video frequency	The currently programmed frame rate is shown in the parentheses to the right. After downloading the MEMOSKOP or after replacement, the MEMOSKOP will start up at the default video frequency (50 Hz). If the monitors are configured for a different video frequency, you must perform "blind" configuration for the correct video frequency. Refer to Configuring video frequency.
Number of monitors	Allows you to program the number of monitors used (1 or 2).
Hardcopy setup	You can configure the connection for hardcopy cameras. Check whether 5000 is programmed for "4 Max Hardcopy time" and if not, program this value.
Edge 1 coef set	Allows configuration of edge enhancement. Check whether 3 is programmed and if not, program this value.
Edge 2 coef set	Allows Configuration of edge enhancement. Check whether 8 is programmed and if not, program this value.
Motion detection setup	Configures the motion detector. Check if at MD 1: Threshold 100 and at MD 2: Threshold 120 is programmed, if not, program these values.
Circle mask setup	Allows you to configure the diameter of the circle mask.

Function:	Comments:
Move text positions	Allows you to configure the position of superimposed text.
Date / Time format	European: TT MM JJ / HH MM US: MM DD YY / HH MM
System configuration	Allows you to read out the current Memoskop configuration.
Keyboard	Allows you to program the corresponding keyboard layout Universal / Roman / English.
Graphics level	Level (brightness) of superimposed text. (Default: 128)
Display of real time clock	Yes: Real time clock (date and time) are displayed depending on the User setup programming for MEMOSKOP. The real time clock is active. NO: The real time clock is switched off. The User setup programming will not affect it.
Display of rotated images	Yes: By pressing the image rotation key, the current image will be recalculated and displayed. NO: The rotated image will not be recalculated by pressing the image rotation key. For SIREMOBIL Compact L always set to YES.
Monitor zoom	Yes: When pressing the key for MEMOSKOP - Zoom, the image will be displayed enlarged. NO: The MEMOSKOP - Zoom key has no function. For SIREMOBIL Compact L set to NO.
Monitor split	Yes: Horizontal or vertical image split possible. No: No horizontal or vertical image split possible. Program Yes.
Monitor text	Yes: Superimposes text. No: No text superimposition. For SIREMOBIL Compact L always set to Yes.
Maximum image numbers	The number of stored images can be programmed. Program the value to 700 for MEMOSKOP C and to 900 for MEMOSKOP SUB. For MEMOSKOP C-E 100 program the value to 100. For MEMOSKOP CE, this parameter is not used.
Product name	Allows you to change the MEMOSKOP name, displayed during system booting. Do not change this for SIREMOBIL Compact L!
Diagnostics	Allows you to invoke test routines for repair by the manufacturer of the MEMOSKOP. The MEMOSKOP can be reset via "Load factory default," as required. Subsequently you have to program accordingly. The same applies if you replace the MEMOSKOP.

Function:	Comments:
Create External disk (1)	MEMOSKOP CE and MEMOSKOP CE-100: Program the value to "No". All other types of MEMOSKOP: If a MOD drive is implemented and/or the option DICOM Bridge is installed, program the value to "Yes".
Enable Bridge (1)	MEMOSKOP CE and MEMOSKOP CE-100: Program the value to "No". All other types of MEMOSKOP: If a MOD drive is implemented and/or the option DICOM Bridge is installed, program the value to "Yes".
Default programs changeable	Default: Yes The organ programs can be protected against changes by setting "No".
Default LUT	After switch-on, the programmed brightness/contrast curve (LUT) is selected automatically. Default: LUT 2
Default LUT for Subtraction	After switch-on, the programmed brightness/contrast curve (LUT) is selected automatically for the subtraction mode, when equipped with a MEMOSKOP C-SUB. Default: LUT 1
Default Edge	After switch-on, the programmed edge enhancement is selected automatically. Default: Edge 1
Software backward compatible	Not implemented "Must be set to No".
Unit serial number	Enter the serial number of the SIREMOBIL Compact L if it is equipped with a Dicom bridge. The serial number is required for identifying the images transferred. Please note that you have to omit the leading 0 when entering the serial number.
Disable dose rate selection in user Setup	Set to "Yes" for SIREMOBIL Compact L without an area dose product measurement device. Set to "No" for SIREMOBIL Compact L with an area dose product measurement device.
Subtraction K-factor, phase A	Noise suppression, phase A, is programmed in the SUB-mode. Phase A: Mask acquisition.
Subtraction K-factor, phase B	Noise suppression, phase B, is programmed in the SUB mode. Phase B: Acquisition of fill image.
Subtraction Time of phase A	The time of phase A in the SUB-mode is programmed. Phase A: Mask acquisition.
Roadmap K-factor, phase A	Noise suppression, phase A, is programmed in the roadmap mode. Phase A: Mask acquisition.
(1) in menu Diagnostics	

Function:	Comments:
Roadmap K-factor, phase B	Noise suppression, phase B, is programmed in the roadmap mode. Phase B: Acquisition of fill images.
Roadmap K-factor, phase C	Noise suppression, phase C, is programmed in the roadmap mode. Phase C: Acquisition of roadmap images.
Roadmap Time of phase A	The time of phase A in the roadmap mode is programmed. Phase A: Mask acquisition.

Configuring the MEMOSKOP C / C-E / C-SUB

MEMOSKOP C-E, keyboard emulation

There is no keyboard supplied with some SIREMOBIL Compact L units and installed MEMOSKOP C-E. When replacing the MEMOSKOP C-E or when changing the configuration, the MEMOSKOP service program should be used.

The help file "C-DATA.hlp" will be copied to the service PC during installation of the MEMOSKOP service program. The "C-DATA.hlp" help file contains descriptions of the programming.

Configuring the video frequency

After replacing the MEMOSKOP C / C-E / C-SUB, it will start at a default video frequency (50 Hz). If the monitors were configured for a different frequency, you will have to configure the correct video frequency without a "visible image".

With out installed MEMOSKOP keyboard:

- Use the MEMOSKOP C / C-E / C-SUB service program to modify the configuration.

With installed keyboard proceed with the steps described below:

- Invoke Technical Setup on Memoskop (press the CTRL + T keys.)
- Press the "2" key and press return. The video frequency menu is selected.
- Depending on the required video frequency, press the right cursor key "->".

"->" pressed 1 time:	60 Hz video frequency
"->" pressed 2 times:	100 Hz video frequency
"->" pressed 3 times:	120 Hz video frequency
"->" pressed 4 times:	50 Hz video frequency.

"->" = Press the right cursor key

"<-" = Press the left cursor key.

Key "->":	(Start)	"->"	"->"	"->"	"->"	...
Video frequency	50 Hz	60 Hz	100 Hz	120 Hz	50 Hz	etc...
Key "<-":	"<-"	"<-"	"<-"	"<-"	"<-"	"<-"

After selecting the desired video frequency, press "Return".

This configures the video frequency you have just selected.

After switching the SIREMOBIL OFF and ON again, the MEMOSKOP will start up at the correct video frequency.

MEMOSKOP C / C-E / C-SUB, configuration for the number of existing monitors

When you replace the MEMOSKOP C / C-E / C-SUB, it will be configured for 2 monitors. This configuration displays USER SETUP and TECHNICAL SETUP on the second monitor.

Therefore, USER SETUP and TECHNICAL SETUP are not visible for SIREMOBIL Compact L systems with only one monitor.

Without installed MEMOSKOP keyboard.

- Use the MEMOSKOP C / C-E / C-SUB service program to modify the configuration.

With installed MEMOSKOP keyboard proceed as follows:

- Switch the SIREMOBIL Compact L on.
- On the MEMOSKOP C / C-E / C-SUB, reconnect the video cable from OUT 1 to OUT 2.
- Press CTRL + T at the same time on the MEMOSKOP keyboard; TECHNICAL SETUP is called up and is now visible on the monitor.
- Call up the menu "Number of monitors" by pressing the "3" key and subsequently the "RETURN" key on the MEMOSKOP keyboard.
- With the -> and <- cursor keys, set the number to 1 monitor and press the "RETURN" key. The text display disappears on the monitor.
- Press the "RETURN" key once more.
- Reconnect the monitor to the OUT 1 video output. The text display is now visible on the monitor.
- Exit TECHNICAL SETUP by pressing the "HOME" key on the MEMOSKOP keyboard.

MEMOSKOP C / C-E / C-SUB, configuration and country-specific language (User Setup)

Start the program and transfer the country-specific language file to SIREMOBIL Compact L via the service PC.

Overview of MEMOSKOP CX200 parameters

NOTE

The parameters for the MEMOSKOP CX200 image memory programmed on site were saved on CD-R (Backup).
When the image memory is replaced the parameters can be transferred to the new MEMOSKOP CX200 again (Restore).
It is normally not necessary to program the parameters manually.
The CD-R is filed in the log book for the system.

MEMOSKOP CX200 operation

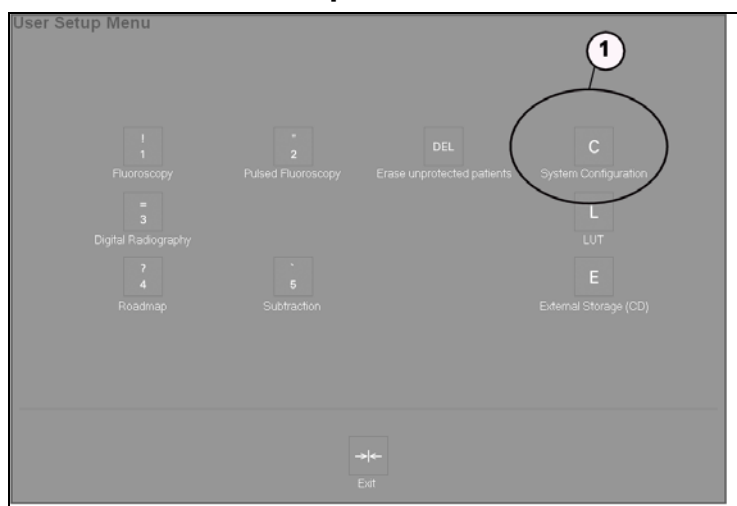


Fig. 9 Operation Example 1

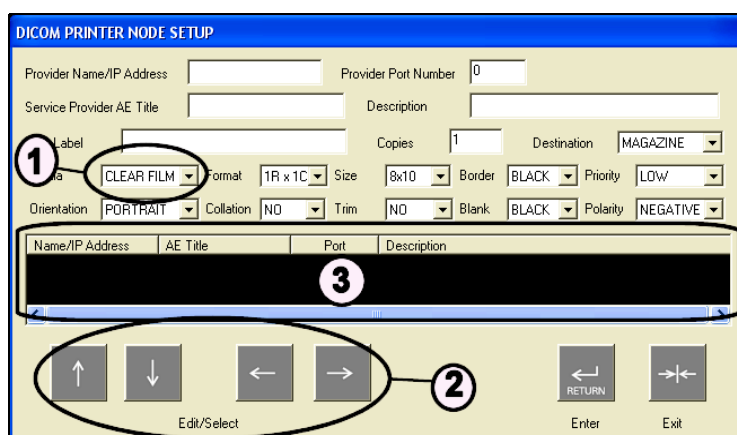


Fig. 10 Operation Example 2

Start User Setup	- Press "CTRL" + "U" simultaneously.
Start Technical Setup	- Press "CTRL" + "T" simultaneously. - Then enter the password and press "Return".
Select a submenu	- Press the appropriate key (number or letter) shown above or to the right of the menu description. Example, 1/ Fig. 9, User Setup main menu: Pressing the "C" key opens the "System Configuration" submenu.
Close a submenu	- Press the "Home" key. - If files were changed a confirmation prompt is displayed. - To save the changes press the "Return" key. - To discard the changes press the "Home" key.
Switch between entry fields in a submenu	- Arrow keys UP DOWN LEFT RIGHT, see also 2/ Fig. 10
Select / deselect checkboxes in a submenu (set / remove check mark)	- Select the checkbox with arrow keys. - Press the "Return" key.
Select / deselect list boxes in a submenu	- Select the list box with arrow keys. - Press the "Return" key.
Select an entry in a list box 1/ Fig. 10	- Highlight the list box with arrow keys. - Open the list box with "Return". - Select the desired entry with the UP DOWN arrow keys. - Confirm selection with "Return".
Transfer data records into text fields 3/ Fig. 10	- Press "CTRL" + "A" simultaneously. Example 3 / Fig. 10, DICOM printer configuration: After entering the DICOM node data and setting the list box entries, you can press "CTRL"+"A" to transfer these as a data line into the text field 3/ Fig. 10.

Change data records displayed in text fields 3/ Fig. 10

- With the arrow keys select the data line in the text field to be changed 3/ Fig. 10.
- Press "Return" to also enter the data in the text fields and list boxes located above.
- Select the text or list box to be changed with the arrow keys.
- Change the text, or open the list box with "Return". Select another entry with the arrow keys and press "Return".
- Press "CTRL"+"A" simultaneously.
- An additional data line is displayed in the text field 3/ Fig. 10.

If the old data line is no longer needed it can be deleted.

Delete data records displayed in text fields 3/ Fig. 10

- Select the data line in the text field to be deleted with the arrow keys 3/ Fig. 10.
- Press "CTRL"+"D" simultaneously.
- The data line is deleted.

User Setup

- The User Setup is invoked with the CTRL + U key combination.
- The available functions are described in the SIREMOBIL Compact L Operating Instructions.

Technical Setup

Technical Setup Main menu

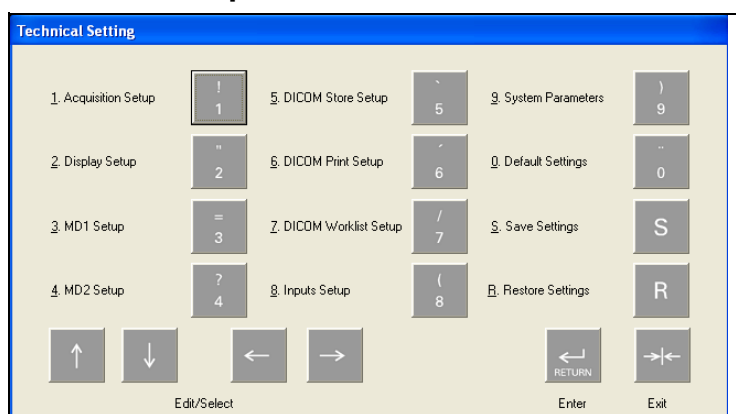


Fig. 11 Technical Setup Main menu

- The technical setup is invoked with the CTRL + T key combination.
- Enter the password and confirm with [RETURN]

The following functions can be invoked depending on the installed options of the MEMOSKOP CX200

Function:	Comments:
1 Acquisition Setup	Noise reduction and timing parameter settings for DSA operating modes Subtraction and Roadmap
2 Display Setup	LUT settings, Edge enhancement settings, Circle Mask settings, Graphic settings
3 MD1 Setup	Motion detection MD1 settings
4 MD2 Setup	Motion Detection MD2 settings
5 DICOM Store Setup	Network DICOM Storage Node settings
6 DICOM Print Setup	Network DICOM Print Node settings
7 DICOM Worklist Setup	Network DICOM Worklist Node settings
8 Input Setup	Input Video signal settings
9 System Parameters	Product specific settings, Hardcopy settings, network setting and settings for country specific regulatories.
0 Default Setup	All parameters will be set to the default values.
S Save Settings	Starts the Backup of all parameters (user setup, technical setup and licenses)
R Restore Settings	Starts the Restore of all parameters (user setup, technical setup and licenses)

Technical Setup 1 Acquisition Setup

The screenshot displays the 'ACQUISITION MODE' window. It contains several input fields and dropdown menus for configuring acquisition parameters. The 'Sub phase A K-Factor' is set to 16, 'Sub phase A time' to 15, and 'Sub phase B K-Factor' to 8. The 'Roadmap phase A K-Factor' is 16, 'Roadmap phase B K-Factor' is 8, and 'Roadmap phase C K-Factor' is set to MD2. The 'Roadmap phase A time' is 15. At the bottom, there are navigation buttons: 'Edit/Select' (with up, down, left, and right arrows), 'Enter' (with a return key icon), and 'Exit' (with a double arrow icon).

Fig. 12 Technical Setup Acquisition Setup

- The Acquisition Setup includes the timing settings and noise reduction factor settings for DSA mode Subtraction and Roadmap

Function:	Comments:
Sub phase A K-Factor	Noise suppression, phase A, is programmed in the SUB-mode. Phase A: Mask acquisition
Sub phase A time	The time of phase A in the SUB-mode is programmed. Phase A: Mask acquisition

Function:	Comments:
Sub phase B K-Factor	Noise suppression, phase B, is programmed in the SUB mode. Phase B: Acquisition of fill image.
Roadmap phase A K-Factor	Noise suppression, phase A, is programmed in the roadmap mode. Phase A: Mask acquisition.
Roadmap phase B K-Factor	Noise suppression, phase B, is programmed in the roadmap mode. Phase B: Acquisition of fill images.
Roadmap phase C K-Factor	Noise suppression, phase C, is programmed in the roadmap mode. Phase C: Acquisition of roadmap images.
Roadmap phase A time	The time of phase A in the roadmap mode is programmed. Phase A: Mask acquisition.

Technical Setup 2 Display Setup

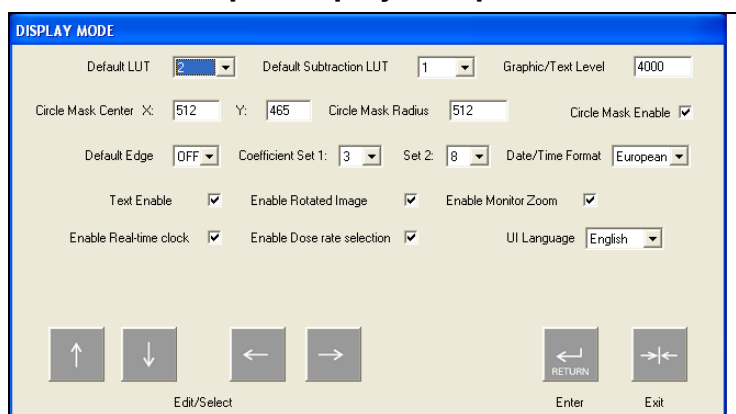


Fig. 13 Technical Setup, Display Setup

- The Display Setup includes the default LUT settings, circle mask settings and graphic settings, default edge enhancement settings, default display settings and user interface language setting.

Function:	Comments:
Default LUT	After power-on, the programmed brightness/contrast curve (LUT) is selected automatically. Default: LUT 2
Default Subtraction LUT	After switch-on, the programmed brightness/contrast curve (LUT) is selected automatically for the subtraction mode, when equipped with a MEMOSKOP CX200 including the DSA license. Default: LUT 1
Graphic/Text Level	Level (brightness) of superimposed text. (Default: 4000)
Circle Mask Center X	Allows you to shift the center of the circle mask in the horizontal direction.

Function:	Comments:
Circle Mask Center Y	Allows you to shift the center of the circle mask in the vertical direction.
Circle Mask Radius	Allows you to change the diameter of the circle mask.
Circle Mask Enable	Enables (circle mask visible) or disables (circle mask not visible).the circle mask.
Default Edge	After power-on, the programmed edge enhancement is selected automatically. Default: Edge 1
Coefficient Set 1	Allows configuration of edge enhancement. Check whether 3 is programmed and if not, program this value.
Coefficient Set 2	Allows Configuration of edge enhancement.Check whether 8 is programmed and if not, program this value.
Date/Time Format	European: DD.MM.YY / HH MM US: MM DD YY / HH MM
Text Enable	Enabled: Text is displayed on the monitors Disabled: No text is displayed For SIREMOBIL Compact L always enabled.
Enable Rotated Images	Enabled: By pressing the image rotation key, the current image will be recalculated and displayed. Disabled: The rotated image will not be recalculated by pressing the image rotation key. For SIREMOBIL Compact L always enabled.
Enable Real-time clock	Enabled: Real time clock (date and time) are displayed depending on the User setup programming for MEMOSKOP. The real time clock is active. Disabled: The real time clock is switched off. The User setup programming will not affect it.
Enable Monitor Zoom	Enabled: When pressing the key for MEMOSKOP - Zoom, the image will be displayed enlarged. Disabled: Memoskop - Zoom key has no function For SIREMOBIL Compact L always enabled.
Enable Dose rate selection	Disabled: For SIREMOBIL Compact L without an area dose product measurement device. Enabled: For SIREMOBIL Compact L with an area dose product measurement device.
UI Language	Select the language, needed. Selectable languages for the user interface: English Spanish, French, Italian, German

Technical Setup 3 MD1 Setup

MD1 SETTING

MD Minimum K-Factor 1 MD Maximum K-Factor 4

MD Threshold value 1600

↑ ↓ ← → Edit/Select

RETURN Enter Exit

Fig. 14 Technical Setup, MD1 Setup

- The MD1 Setup includes the motion detection settings for motion detection 1 (MD1).

Function:

MD1 Minimum K-Factor

MD1 Maximum K-Factor

MD Threshold value

Comments:

Minimum K-Factor, if motion is detected in the image.
Default K-Factor: 1

Maximum K-Factor, if no motion is detected in the image.
Default K-Factor: 4

Sensitivity of the motion detection circuit
Default value: 1600

Technical Setup 4 MD2 Setup

MD2 SETTING

MD Minimum K-Factor 2 MD Maximum K-Factor 16

MD Threshold value 1920

↑ ↓ ← → Edit/Select

RETURN Enter Exit

Fig. 15 Technical Setup, MD2 Setup

- The MD2 Setup includes the motion detection settings for motion detection 2 (MD2).

Function:

MD2 Minimum K-Factor

MD2 Maximum K-Factor

MD Threshold value

Comments:

Minimum K-Factor, if motion is detected in the image.
Default K-Factor: 2

Maximum K-Factor, if no motion is detected in the image.
Default K-Factor: 16

Sensitivity of the motion detection circuit
Default value: 1920

Technical Setup 5 DICOM Storage Setup

Fig. 16 Technical Setup, DICOM Storage Node Setup

- The DICOM Storage Setup includes the DICOM storage node settings (network settings).

Function:

Provider Name / IP-Address

Comments:

IP Address of the DICOM Storage Node.

Example: 192.168.20.1

Note: Enter the IP Address here.

A Host name instead of the IP Address can be used only if DHCP is activated.

Provider Port Number

Network Port number for DICOM Services

Default: 104

Service Provider AE Title

Application Entity Title of the DICOM Storage Node.

Description

Name of the DICOM Storage Node, displayed in the MEMOSKOP CX200, using the DICOM Send function.

Note: Only the first three entries are displayed in the MEMOSKOP CX200 user interface.

Technical Setup 6 DICOM Print Setup

Fig. 17 Technical Setup, DICOM Printer Node Setup

- The DICOM Print Setup includes the DICOM Printer node settings (network settings) and additional settings for adapting the existing DICOM Printer to the SIREMOBIL Compact L DICOM Printer functionality.

Function:	Comments:
Provider Name / IP-Address	IP Address of the DICOM Printer Node. Example: 192.168.20.2 Note: Enter the IP Address here. A Host name instead of the IP Address can be used only if DHCP is activated.
Provider Port Number	Network Port number for DICOM Services Default: 104
Service Provider AE Title	Application Entity Title of the DICOM Printer Node.
Description	Name of the DICOM Printer Node, displayed in the MEMOSKOP CX200, using the DICOM Print function. Note: Only the first three entries are displayed in the MEMOSKOP CX200 user interface.
Film Label	Text, always printed on the film. E.g. for identification of the sending node.
Copies	Count of copies, from one sent image. Default: 1
Destination	Used Film sheet tray of the DICOM Printer
Media	Media type Clear Film / Blue Film
Format	Number of Rows and Columns on one film sheet
Size	Size of film sheet
Border	Color of border Black or White (transparent)
Priority	Priority of the printed (sent) image
Orientation	Portrait or Landscape
Collation	No: If multiple images will be sent to the printer, each image will be printed immediately. Yes: If multiple images will be sent to the printer, the printer starts printing after 1 film sheet is completed. (Depending on the programmed format)
Trim	If the image aspect ratio (H:V) is not equal with the film aspect ratio (H:V) the image aspect ratio will be converted to the film aspect ratio:
Blank	Blank film partitions (not used partitions of the film) will be printed in black or white (transparent)
Polarity	Negative (image like monitor) or Positive (image like exposed X-ray film)

Technical Setup 7 DICOM Worklist Setup

Fig. 18 Technical Setup, DICOM Worklist Node Setup

- The DICOM Worklist Setup includes the DICOM Worklist node settings (network settings).

Function:

Provider Name / IP-Address

Comments:

IP Address of the DICOM Worklist Node.

Example: 192.168.20.1

Note: Enter the IP Address here.

A Host name instead of the IP Address can be used only if DHCP is activated.

Provider Port Number

Network Port number for DICOM Services

Default: 104

Service Provider AE Title

Application Entity Title of the DICOM Worklist Node.

Description

Name of the DICOM Worklist Node, displayed in the

MEMOSKOP CX200, using the DICOM Worklist function.

Note: Only the first three entries are displayed in the MEMOSKOP CX200 user interface.

Technical Setup 8 Input Setup

Fig. 19 Technical Setup, Input Setup

- The Input Setup includes the video input timing settings, the MEMOSKOP CX200 keyboard layout setting and the selection of test images.

Function:	Comments:
Vertical Frequency	50 for 50Hz video camera, installed. 60 for 60Hz video camera, installed.
Total Lines / Frame	Default settings are visible. Settings can't be changed.
Keyboard Layout	Universal or Roman
Video Test Pattern	For service proposes, select the needed test pattern.

Technical Setup 9 System Setup

SYSTEM PARAMETERS

Product Name: Siremobil Compact

Serial Number: 3051

Maximum Images: 200

Maximum Hard Copy Time: 50

Viking Interface: ☐

Viking Exposure Time: 5

Viking Maximum Timeout: 20

Hard Copy LUT: HC

System Host Name: speed2

DHCP Enable: ☐

System IP Address: 0.0.0.0

System Net Mask:

Default Gateway:

Default Program Changeable: ☒

Navigation buttons: Edit/Select (up, down, left, right), Enter (RETURN), Exit

Fig. 20 Technical Setup, System Setup

- The System Setup includes the product specific settings, network settings, local hard-copy settings and settings for country specific regulatories.

Function:	Comments:
Product Name	SIREMOBIL Compact
Serial Number	SIREMOBIL Compact serial number.
Maximum Images	Displays the number of maximum images, depending on the licenses installed. Parameter is read only.
Maximum Hard Copy Time	(1/10 seconds) The remote switch and video signal for the local installed hard copy (Video printer / MULTISPOT 2000) is active for the programmed time. Default: 50 (5 seconds)
Viking interface	Only used for local hard copy units with viking interface. Default: Disabled
Viking Exposure Time	Only used for local hard copy units with viking interface. Default: 5 (0.5 seconds)
Viking Maximum Timeout	Only used for local hard copy units with viking interface. Default: 20 (2 seconds)
System Host Name	Network host name of the SIREMOBIL Compact L Example: siremobil
System IP Address	Network IP address of the SIREMOBIL Compact L example: 192.168.20.10

Function:	Comments:
System Net Mask	Network sub net mask of the SIREMOBIL Compact L Example: 255.255.255.0
DHCP Enable	Enabled: Network DHCP is active Disabled: Network DHCP is not used Default: Disabled DHCP should be used only on special customers request.
Default Program Changeable	Enabled: The first organ programs of the available operating modes can be changed in the user setup Disabled: The first organ programs of the available operating modes are fixed and can't be changed in the user setup. Default: Austria: Disabled, all other countries: Enabled.

Technical Setup 0 Default Setup

The Default Setup resets all parameter to the default values.

The parameters stored in the technical setup and the user setup (organ programs) will be set to the default values.

Use this function, if the MEMOSKOP CX200 needs to be set in the default status.

After setting all parameters to the default values, reprogram the values to the previous stored values. See section "MEMOSKOP CX200 Restore"

Technical Setup S Save Settings

Starts the Backup of all parameters (user setup, technical setup and licenses)

- For more details, see section "MEMOSKOP CX200 Backup"

Technical Setup R Restore Setup

Starts the Restore of all parameters (user setup, technical setup and licenses)

- For more details, see section "MEMOSKOP CX200 Restore"

Control board D1

WARNING

Electrical voltage!
See Chapter 1, Safety Information.

Make sure that LED V400 on board D2 is off prior to performing any work on boards D1 and D2. This should occur approximately 3 minutes after switching the SIREMOBIL Compact L OFF.

- Disconnect board D1 completely.
- Replace board D1.
- Reconnect all cable connections.
- Be sure that the shielding and ground connections are seated correctly.
- Set the jumpers and switches according to the circuit diagram.
- Perform the download procedure for control board D1 (Host/Arc/Fil.).

NOTE

In case the EE-PROM of the replacement D1 is not completely deleted, it will be automatically cleared after the host software has been downloaded.

The delete procedure is indicated as "d" on the 7 segment display and requires approximately 5 minutes.

During the delete procedure, do not switch off the system or perform additional programming.

After successful deletion, the 7 segment display will return to normal status display.

- After download, wait 1 minute until the system has rebooted.
- Load the system parameters onto board D1.
(Select DATA menu, RESTORE Parameter and click Restore.)
- Perform the kV offset adjustment.
- Perform the generator adjustment (filament circuit learning program).
- Check the dose rate control and adjust it if necessary.
- Ensure that the camera rotation is functioning properly. Adjust if necessary.
- Ensure that the collimator is functioning properly. Adjust if necessary.
- Check the display functions and setting of the blades on the monitor. Adjust if necessary.
- Ensure that the area dose product measurement device (where present) is functioning correctly.
- Ensure that the laser targeting device (where present) is functioning properly.
- Test the FL / PFL / DR and direct exposure functions of the SIREMOBIL Compact L.

Power board D2



Electrical voltage!
See Chapter 1, Safety Information.

Make sure that LED V400 is off prior to performing any work on boards D1 and D2. This should occur approximately 3 minutes after switching the SIREMOBIL Compact L OFF.

- Disconnect boards D1 and D2 completely.
- Disconnect the cables between boards D1 and D2.
- Remove board D1 and D2.
- Apply heat conducting paste to the heat sink for the power semiconductor on the new D2 board.
- Reinstall board D2 and D1 and reattach all connections.
- Ensure that the shielding and ground connections are positioned correctly.
- Perform the kV offset adjustment and the generator adjustment (filament learning).
- Test the FL / PFL / DR and direct exposure functions (if there is a cassette holder).

Interface board D3



Electrical voltage!
See Chapter 1, Safety Information.

Switch the system power supply off and disconnect the power plug.

- Replace interface board D3.
- Check the +26.75 V voltage for the I.I. mini voltage supply. Adjust it if necessary. Refer to Chapter 3 of these instructions and check the operating voltages.
- Check the radiation release / format switch over / vertical column travel functions.

D40 board for downward travel of the lifting column



Electrical voltage!
See Chapter 1, Safety Information.

Switch the system power supply off and disconnect the power plug.

- Replace the D40 board.
- Using the operating instructions for the basic system, check both the movements of the C-arm and the signal messages.

VIDEOMED DC

- Set the camera rotation to the 0° position and mark the position of the VIDEOMED DC relative to the rotating I.I. optics.
- Switch the system OFF and wait approximately 3 minutes for the anode voltage of the I.I. mini voltage supply to drop.
- Disconnect the I.I. anode cable from the I.I. mini voltage supply.
- Make sure to short out the residual charge to ground.
- Ensure the correct high tension cable lengths by marking the position of the mounting cap nut on the anode cable with a colored pencil or electrical tape.
- Remove the O-ring and the cap nut from the anode cable.
- Disconnect the cable from the VIDEOMED DC and the Compact L optics.
- Cut the cable ties securing the cable.
- Replace the VIDEOMED DC. Ensure that the VIDEOMED DC is at the 0° position relative to the rotating I.I. optics.
- Reconnect the VIDEOMED DC - Compact L optic cable and secure it with a cable tie. Make sure that the cable does not protrude past the edge of the board. It must lie in the recess of the VIDEOMED DC board.
- Reroute the anode cable to the I.I. mini voltage supply.
- Reinstall the cap nut (as marked).
- Reinstall the O-ring.
- The distance from the cap nut to the beginning of the white insulation of the anode cable should be 70 mm.
- Reconnect the anode cable and secure it.
- Check the camera rotation and adjust it if necessary.
The camera should rotate + 220° + 3° or - 220° - 3° (check this using the display).
- Check the dose rate and adjust it if necessary.
- Check the image sharpness with the IQ Quick test and, if necessary, adjust it at the I.I. optics.
- Perform the IQ Quick test.
- If the system is used in combination with a navigation system, inform the customer that the accuracy of the navigation system needs to be checked.

Power supply M14, +5 V / +15 V / -15 V



WARNING

Electrical voltage!

See Chapter 1, Safety Information.

Switch the system power supply off and disconnect the power plug.

- Replace the power supply.

- Check the power supply voltage and adjust it if necessary. Refer to Chapter 3 of these instructions and check the operating voltages.

Power supply M13, +12.3 V VIDEOMED DC

⚠ WARNING

Electrical voltage!

See Chapter 1, Safety Information.

Switch the system power supply off and disconnect the power plug.

- Replace the power supply.
- Check the power supply voltage and adjust it if necessary. Refer to Chapter 3 of these instructions and check the operating voltages.

17cm / 7" I.I. mini voltage supply

⚠ WARNING

Electrical voltage!

See Chapter 1, Safety Information.

Prior to removing the mini voltage supply, the system must be switched off for at least 3 minutes until the high voltage in the system and in the I.I. mini voltage supply dissipates.

- Loosen the top cover from the I.I. and remove it
- Replace the control panel of the I.I. mini voltage supply (installed above Videomed DC).
- Replace the high voltage panel of the I.I. mini voltage supply.
(Mounted on the C-arm, accessible after removing the cover near the I.I., on the outer edge of the C-arm. Refer to Chapter 1, "Information regarding this document").
- Refer to the I.I. test protocol for the voltages E1 / E2 / E3 and A. Check and adjust them, if necessary, according to Chapter 3, "Checking the operating voltages".
- Reinstall all covers.
- Check the functions and adjustments of the collimator. Readjust if necessary.
- Check the display functions and setting of the blades on the monitor. Adjust if necessary.
- Check the overall resolution according to the IQ Quick test.
- Perform the IQ Quick test.
- If the system is used in combination with a navigation system, inform the customer that the accuracy of the navigation system needs to be checked.

23 cm / 9" I.I. mini voltage supply



WARNING

Electrical voltage!

See Chapter 1, Safety Information.

Prior to removing the mini voltage supply, the system must be switched off for at least 3 minutes until the high voltage in the system and in the I.I. mini voltage supply dissipates.

- Loosen the top cover from the I.I. and remove it.
- Loosen the cylindrical cover around the I.I. and remove it.
- Replace the control panel and the high voltage panel of the I.I. mini voltage supply (installed inside the I.I. housing).
- Refer to the I.I. test protocol for the voltages E1 / E2 / E3 and A. Check and adjust them, if necessary, according to Chapter 3, "Checking the operating voltages".
- Reinstall all covers.
- Check the functions and adjustments of the collimator. Readjust if necessary.
- Check the display functions and setting of the blades on the monitor. Adjust if necessary.
- Check the overall resolution according to the IQ Quick test.
- Perform the IQ Quick test.
- If the system is used in combination with a navigation system, inform the customer that the accuracy of the navigation system needs to be checked.

Collimator

- Replace the collimator.
- Ensure that the collimator is functioning properly and is set correctly. Adjust it if necessary.
- Ensure that the collimator blades of the iris diaphragm are visible during fluoroscopy in survey format and zoom format on at least two sides of the monitor image.
- Check the collimation for direct exposure if a cassette holder is being used.
- Check the display of the blades on the monitor and adjust if necessary.
- Remove the old set of collimator labels near the SIREPHOS and attach the new labels included in the same position.
Check that the original collimator labels are the same as the new ones.
- When closing all covers, seal the SIREPHOS cover using sealing compound.
See Chapter 1 "Covers".

SIREPHOS

- Open the SIREPHOS cover (see Chapter 1, "Covers").
- Remove the laser targeting device, if present.
- Remove the dose measurement chamber, if present.
- Remove the collimator.
- Disconnect the SIREPHOS plug.
- Remove the ground screw for the protective conductor.
- Remove the rubber stop of the C-arm on the SIREPHOS side. The screws that secure the SIREPHOS are now visible.
- Remove the SIREPHOS screws. When doing this, have a second person hold the X-ray tube unit.
- Place the new X-ray tube unit on the guide bolts and secure it with both Allen screws.
- Ensure that all cables are routed properly.
- Reconnect the SIREPHOS plug and secure it.
- Reconnect the protective conductor using the ground screw.
- Do not install the rubber stop yet.
- Reinstall the collimator and connect it.
- Reinstall the dose measurement chamber / laser targeting device and connect them.

**WARNING****X-ray radiation!****See Chapter 1, Safety Information.****Protect yourself against radiation exposure. Wear a lead apron.**

- Perform the kV offset adjustment.
- Perform the generator adjustment (filament circuit learning program).
- Ensure that the collimator is functioning properly and is set correctly.
- Ensure that the collimator blades are centered in the blanking circle.
 - If possible, slightly loosen the Sirephos screws and tilt the SIREPHOS to adjust it.
 - Retighten the SIREPHOS screws.
- Ensure that the collimator blades of the iris diaphragm are visible during fluoroscopy in the survey format and zoom format on at least two sides of the monitor image.
- Check the display of the blades on the monitor screen and adjust if necessary.
- Check collimation for direct exposure if there is a cassette holder.
- Reinstall the rubber stop.
- Ensure that the area/dose product measurement device is functioning properly (if present).



- Check the dose rate settings and adjust them if necessary.
- Check the settings of the maximum skin dose rate.

- Check the setting of the laser targeting device and, if necessary, adjust it according to the Adjustment Instructions for the Laser Targeting Device, RXR2-130.032.01.
- Re-attach the SIREPHOS cover.
- Seal the SIREPHOS cover using sealing compound. See Chapter 1 "Covers".

Replacing the I.I.

Checking the temperature indicator

- Prior to installing the I.I., check the temperature indicator:
 - ② If the inner square field of the indicator is white, the I.I. did not exceed the temperature range. Remove the temperature indicator.
 - ② If the indicator is discolored (inner field is black), proceed according to the IQ document AX51-030.812.01...

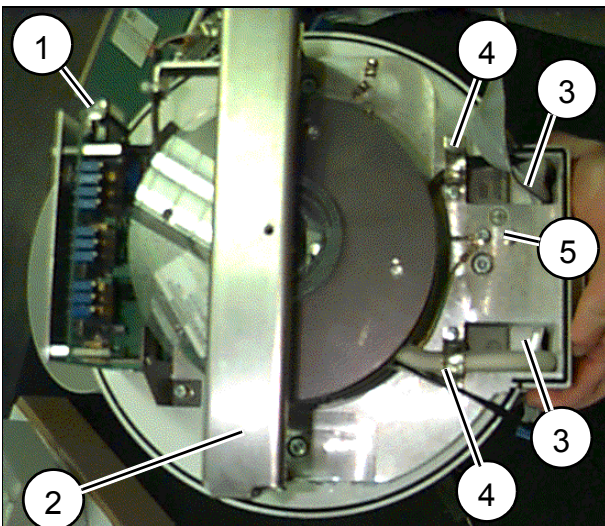


Fig. 1

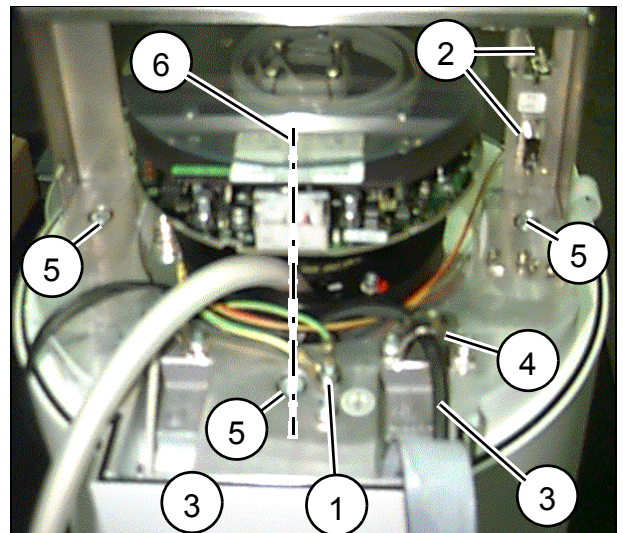


Fig. 2

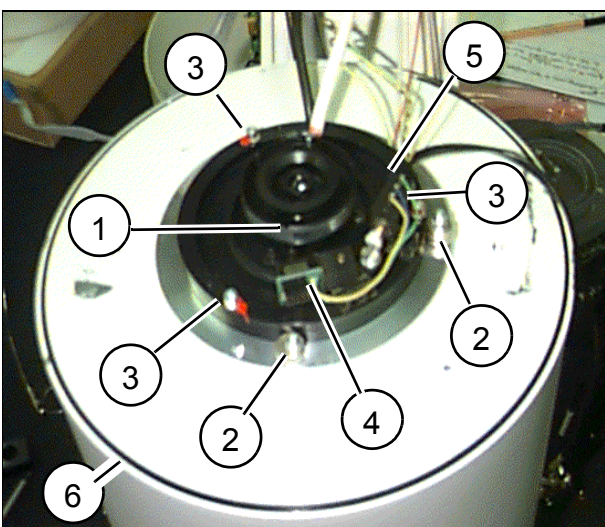


Fig. 3

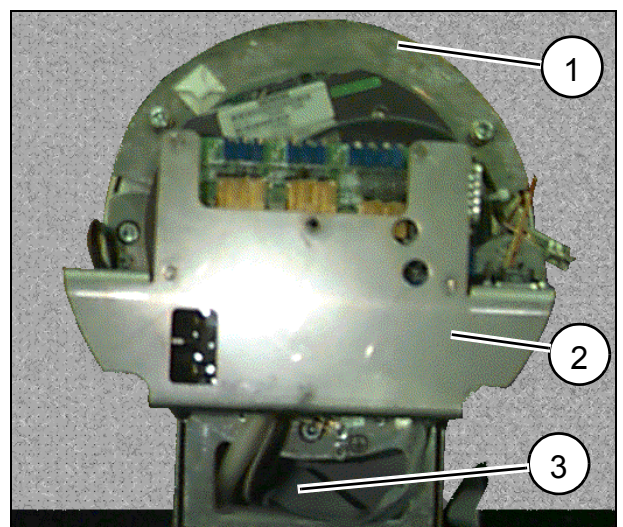


Fig. 4

Removing the old I.I.

WARNING

Electrical voltage!

See Chapter 1, Safety Information.

Prior to removing the mini voltage supply, the system must be switched off for at least 3 minutes until the high voltage in the system and in the I.I. mini voltage supply dissipates.

- Turn the C-arm so that the I.I. is on top.
- Loosen the I.I. top cover and remove it.
- Rotate the camera to the zero position (6/Fig. 2).
- **17 cm / 7" I.I.** : Remove the cover adjacent to the I.I. above the high voltage section on the outer side of the C-arm.
- **23 cm / 9" I.I.** : Remove the cover of the I.I. (Cover around the I.I.).
The control and high voltage sections of the I.I. mini voltage supply are now accessible.
- Remove the high voltage panel and disconnect all cables.
- Remove the O-ring and the cap nut from the anode cable.
- Dissipate any residual voltage in the cables by shorting them to ground.
- **17 cm / 7" I.I.** : Remove the counterbalancing weight on the 7"/17 cm I.I. (1/Fig. 4).
- Disconnect all plugs from the control panel of the I.I. mini voltage supply.
- Disconnect the protective conductor connections and the grounding screw (5/Fig. 1 / 1/Fig. 2).
- Remove plug D4.X1 of the VIDEOMED DC (2/Fig. 2).
- Secure the end of the cable which you have wound up on the cable reel of the Videomed DC with adhesive tape.
- Remove the cable between the VIDEOMED DC and the Compact L optics and cut the cable ties securing it.
- Remove plug X45 of the cassette contact (2/Fig. 2).
- Remove both jacks D4.X1 and X45 from the receptacle (2/Fig. 2).
- **17 cm / 7" I.I.** : Pull the "Anode, E3 and Penning" cables leading from the high voltage panel to the I.I. out of the C-arm (3/Fig. 2).
- **23 cm / 9" I.I.** : Pull the "Anode" cable, leading from the high voltage panel to the I.I., out of the recess.
- Loosen the bracket above the camera and remove it (2/Fig. 1 or 2/Fig. 4).
- Remove the control panel of the I.I. mini voltage supply from the 9"/23 cm I.I.
- Loosen the camera set screw slightly and remove the camera (1/Fig. 3).

NOTE

Do not loosen the eccentric screws (Fig. 3/2) on the edge of the Compact L optics! These are used to center the Compact L optics to the I.I. output screen. When removing the Compact L optics, make sure that no dust or dirt contaminates the I.I. output window or the Compact L optics.

- Loosen the Compact L optics (3/Fig. 3).
- Remove the cable clamps on the cables (4/Fig. 1).
- Disconnect plug M30.X1 (4/Fig. 3).
- Remove the Compact L optics.
- To do this, pull the anode cable out of the Compact L optics recess.
- Rotate the C-arm so that the I.I. is underneath and the tube assembly above.

CAUTION

Risk of crushing!

Noncompliance can cause damage to property.

Apply all C-arm brakes and hold the I.I. when removing the attachment screws.

- Remove the attachment screws from the I.I. mounting. When doing this, hold onto the I.I. (5/Fig. 2).
- Remove the I.I. from the mounting.

Installing the new I.I.

NOTE

When installing the Compact L optics and the VIDEOMED DC, make sure that no dust or dirt contaminates the I.I. output window or the Compact L optics.

- Prior to installing the new I.I. on the C-arm mounting, complete the following work.
- Reinstall the Compact L optics on the new I.I.
 - When doing this, feed the anode cable through the recess in the optics.
The Compact L optics must sit without gap at the eccentric screws.
- Move the camera rotation of the Compact L optics to the zero position.
 - To do this, connect the ohmmeter to the potentiometer for camera rotation, position 2 and 3 (5/Fig. 3).
A resistance value of 5000 ohms, ± 40 ohms must be measured for the center position.
 - Hold the camera rotation by the clamp ring (1/Fig. 3) and turn it to the correct position, if necessary.
- Place the VIDEOMED DC in the zero position on the Compact L optics (6/Fig. 2) and clamp it in place.
- Connect the cable from the VIDEOMED DC to the Compact L optics and secure it with cable ties.
Make sure that the cable lies in the recess of the VIDEOMED DC board and does not protrude past the edge of the board.
- **17 cm / 7" I.I. :** Install the new control panel included in the I.I. delivery volume and connect cables E1 and E2.
- **23 cm / 9" I.I. :** Lead the "Anode" cable through the recess to the I.I. high voltage panel.
- Install the bracket above the camera (2/Fig. 1 or 2/Fig. 4).

- For easier installation, rotate the C-arm so that the I.I. is underneath and the tube assembly above.

**Risk of crushing!**

Noncompliance can cause damage to property.

Apply all C-arm brakes and hold the I.I. when installing and fastening the attachment screws.

- **17 cm / 9" I.I.** : Route the cables for the high voltage section back through the recess in the I.I. (3/Fig. 1 or 3/Fig. 4).
The I.I. can be swivelled slightly to the side to permit easier cable routing.
Swivel the I.I. back again.
When doing this, make sure that all the cables are correctly positioned.
Secure the I.I. on the mounting (5/Fig. 2).
- **23 cm / 9" I.I.** : Secure the I.I. on the mounting.
- The C-arm can now be rotated to permit easier installation of components (I.I. above, tube assembly underneath).
- Reinstall the O-ring and the cap nut on the anode cable.
- The cable length from the beginning of the white wire to the cap nut should be 70 mm.
- **17 cm / 7" I.I.** : Reinstall the high voltage panel in the C-arm and reconnect all the cables.
- **23 cm / 9" I.I.** : Reconnect all the cables at the high voltage panel.
- Reinstall both jacks D4.X1 for the VIDEOMED DC and X45 for the cassette contact on the receptacle.
- Reconnect the D4.X1 plug for the VIDEOMED DC and the X45 plug for the cassette contact.
- Reconnect plug M30.X1.
- Reconnect plug D120.X1 to the control section of the I.I. mini power supply.
- Reconnect the protective conductor to the ground screw (5/Fig. 1).
- Reinstall the cable clips (4/Fig. 1).
- Reinstall the counterbalance weight for the 7"/17 cm I.I.
- Check the existence of the sealing ring 6 /Fig. 3.

NOTE

Check the presence of the sealing ring 6/Fig. 3 at the new I.I. If none is present, remove the sealing ring from the old I.I. (glued to the I.I. housing with 4 to 6 dots), lay it in the groove of the new I.I. housing and fix it with 4 to 6 dots of adhesive (e.g. superglue).

Checks and adjustments

- Check the I.I. electrode voltages according to the test protocol for the I.I.
- Do **not** readjust in cases where there are only slight deviations from the values on the test protocol (measurement device tolerances).

- Check that the camera optics are centered to the I.I. output and adjust them if necessary; refer to "Replacing the camera optics," subitem "Checking the centering of the camera optics to the I.I. output " and "Centering the camera optics to the I.I. output".
- Check the camera rotation and readjust it if necessary.
- Check the setting of the X-iris and readjust it if necessary.
- Check the display of the blades on the monitor and readjust if necessary.
- Check the dose rate and readjust it if necessary.
- Perform the IQ Quick test.
 - When doing this, check the resolution first and, if necessary, readjust the optical resolution of the Compact L optics.
- Complete the country-specific acceptance (§16 Partial acceptance... / DHHS...).
- If the system is used in combination with a navigation system, inform the customer that the accuracy of the navigation system needs to be checked.

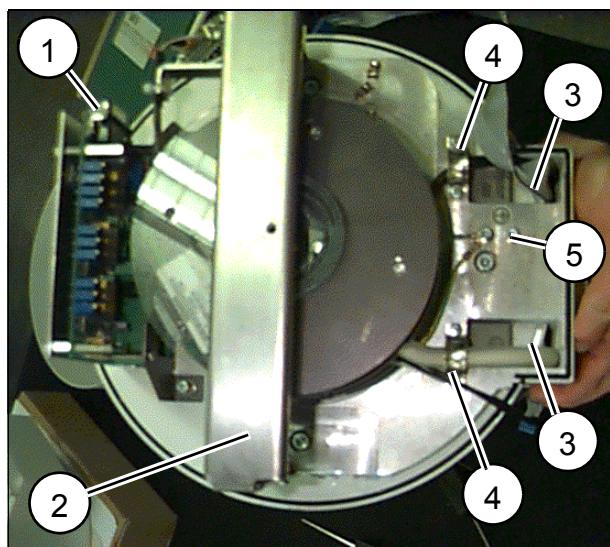


Fig. 5

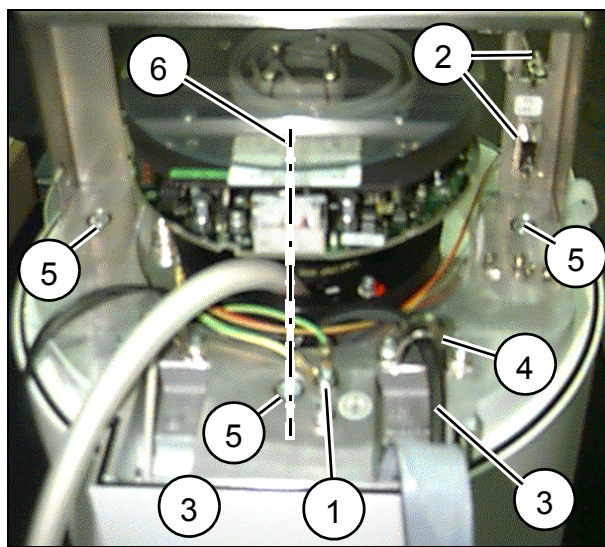


Fig. 6

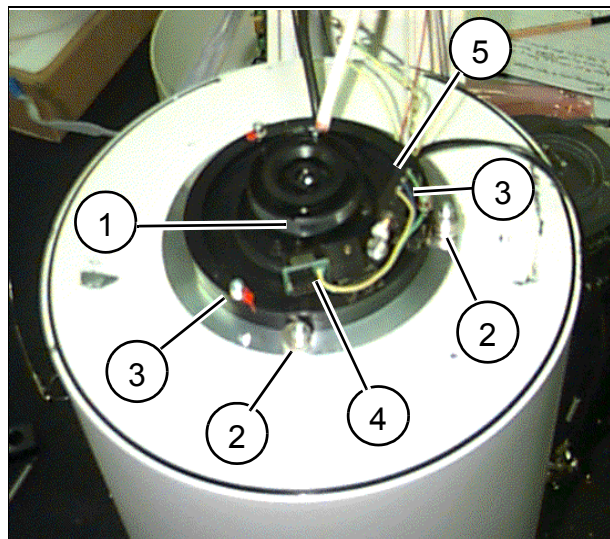


Fig. 7

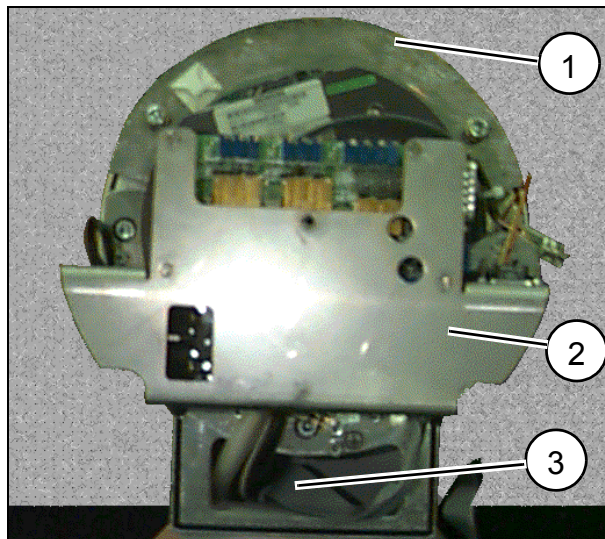


Fig. 8

Replacing the Compact L optics.

⚠ WARNING

Electrical voltage!
See Chapter 1, Safety Information.

Prior to removing the mini voltage supply, the system must be switched off for at least 3 minutes until the high voltage in the system and in the I.I. mini voltage supply dissipates.

Removing the Compact L optics

- Turn the C-arm so that the I.I. is at the top.
- Loosen and remove the I.I. top cover.

- **23 cm / 9" I.I. :** Loosen and remove the cylindrical cover around the I.I. The I.I. power supply is accessible.
- Rotate the camera in the "0" position (6/Fig. 6).
- **17 cm / 7" I.I. :** Remove the cover over the high voltage panel (C-arm away from you, I.I. near you).
- Disconnect the anode cable.
- Short out the residual charge to ground.
- Remove the O-ring and the cap nut from the anode cable.
- Pull out the anode cable from the I.I.
- Disconnect the plugs of the control panel of the I.I. mini voltage supply (1/Fig. 5).
- Disconnect the protective conductor connections and the ground screw (5/Fig. 5).
- Remove plug D4.X1 of the VIDEOMED DC (2/Fig. 6).
- Secure the cable rolled-up in the cable spool of the VIDEOMED DC with adhesive tape.
- Remove plug X45 of the cassette contact (2/Fig. 6).
- Remove jacks D4.X1 and X45 from the clips (2/Fig. 6).
- Loosen the bracket above the camera and remove it (2/Fig. 5 or 2/Fig. 8).
- Disconnect the plug from the VIDEOMED DC and the Compact L optics.
- Cut off the cable ties.
- Loosen the camera set screw slightly and remove the camera (1/Fig. 7).

NOTE

Do not loosen the eccentric screws (2/Fig. 7) on the edge of the Compact L optics. These are used to center the Compact L optics to the I.I. output. When removing the Compact L optics, make sure that no dust or dirt contaminates the I.I. output window or the Compact L optics.

- Disconnect plug M30.X1 (4/Fig. 7).
- Loosen and remove the Compact L optics (3/Fig. 7).
- Remove the rubber gasket.
- Remove the anode cable from the recess in the Compact L optics.

Mounting the Compact L optics

NOTE

When installing the Compact L optics and the VIDEOMED DC, make sure that no dust or dirt contaminates the I.I. output window or the Compact L optics.

- Reinsert the rubber gasket between the I.I. output and the camera optics. Reattach the Compact L optics to the new I.I.
Insert the anode cable through the recess in the optics.
The Compact L optics must sit without gap at the excenter screws.
- Adjust the camera rotation of the Compact L optics to the "0" position (6/Fig. 6).

- To do this, connect an ohm meter to the potentiometer for camera rotation, location 2 and 3 (5/Fig. 7). The resistance must measure 5000 ohms $\pm$ 40 ohms in the middle position.
- If necessary, adjust the camera with the clamping ring (1/Fig. 7) by rotating it to the correct position.
- Install the VIDEOMED DC in the "0" position on the Compact L optics and secure it (6/Fig. 6).
- Connect the VIDEOMED DC - Compact L optics cable and secure it with cable ties. Make sure that the cable does not protrude past the edge of the board and that it lies in the recess of the VIDEOMED DC board.
- Insert the anode cables for the high voltage panel back to the high voltage panel. (3/Fig. 5).
- Reinstall the O-ring and the cap nut on the anode cable.
The cable length should be 70 mm from the beginning of the white wire to the cap nut.
- **17 cm / 7" I.I.** : Reinstall the high voltage panel in the C-arm and reconnect all the cables.
- Mount the bracket above the VIDEOMED DC.
- Reconnect both jacks, D4.X1 for the VIDEOMED DC and X45 for the cassette contact to the retainer clip.
- Connect plugs D4.X1 for the VIDEOMED DC and X45 for the cassette contact.
- Connect plug M30.X1.
- Connect plug D120.X1 to the control panel of the I.I. mini voltage supply.
- Reconnect the protective conductor with the ground screw (5/Fig. 5).
- Reinstall the cable clamps (3/Fig. 6).
- Attach 2.1 mm Cu and 60 mm Al prefiltration to the radiation port of the SIREPHOS.
- Attach the resolution test to the I.I. input screen and check the optical resolution. Readjust it if necessary.
- Remove the resolution test from the I.I. input screen.
- Check the dose rate and readjust it if necessary.

Checking the camera optics centering at the I.I. output



WARNING

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

- Mark the center of the I.I. input as precisely as possible using a small washer and adhesive tape. If there is a laser light localizer, the I.I. attachment with the lead cross can also be used.
- Select the survey format.
- Move the camera into the 0° position.
- Switch fluoro on briefly.
- Mark the center of the washer or lead cross on the monitor (see Fig. 9).



- Rotate the camera in the -220° position.
- Mark the center again on the monitor (see Fig. 9).

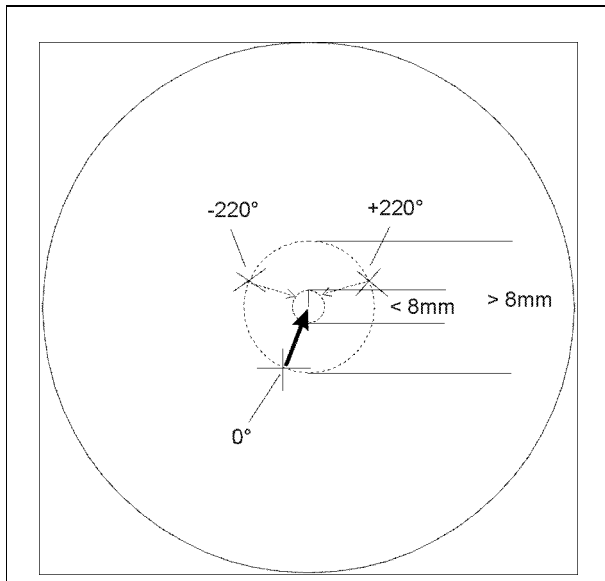


Fig. 9

- Rotate the camera in the in $+220^\circ$ position.
- Mark the center again on the monitor (see Fig. 9).
- Place an 8 mm washer over the three markings.
All three markings must be located within the 8 mm diameter of the washer. An 8 mm washer has a somewhat larger inner diameter of 8.4 mm, therefore the markings must clearly lie within the inner diameter and should not touch the edge of the washer.
- If the diameter is ≤ 8 mm, the following centering adjustment does not have to be performed.
Continue with "checks and adjustments".
- If the markings exceed > 8 mm, proceed as follows:

Centering the camera optics to the I.I. output

⚠ WARNING

X-ray radiation!

See Chapter 1, Safety Information.

Protect yourself against radiation exposure. Wear a lead apron.

Prerequisite: The $+220^\circ$, -220° and 0° positions were already marked as previously described.

- Rotate the camera optics back to the 0° position.
- Slightly loosen the three attachment screws of the camera optics.
- Slightly loosen both excenter screws adjacent to the camera optics.
- Move the camera optics toward the center, between both $+220^\circ$ and -220° markings (see also Fig. 9).



- Switch fluoro on briefly and evaluate the position on the monitor. According to the ratio of the I.I. input screen diameter to the I.I. output screen diameter, a shift of the camera optics by approximately 0.1 mm corresponds to a position shift of the washer displayed on the monitor of more than 1.3 mm (17 cm I.I.) or 1.7 mm (23 cm I.I.).

- Secure the camera optics again.
- Erase the three markings on the monitor.



- Switch fluoro on briefly and mark the new 0° position.
- Rotate the camera to the -220° position.
- Mark the center on the monitor.
- Rotate the camera to the + 220° position.
- Mark the center on the monitor.
- Place an 8 mm washer over the three markings. All three markings must be located within the 8 mm diameter of the washer. An 8 mm washer has a somewhat larger inner diameter of 8.4 mm, therefore the markings must clearly lie within the inner diameter and should not touch the edge of the washer. If necessary, repeat the adjustment until the three markings fall within the 8 mm diameter.
- Secure the camera optics.
- Retighten the excenter screws of the camera optics.

Checks and adjustments



- Check the camera rotation and adjust it if necessary.
- Check the setting of the radiation iris and readjust it if necessary.
- Check the display of the blades on the monitor and adjust if necessary.
- Check the dose rate again and adjust it if necessary.
- Perform the IQ quick test.
- If the system is used in combination with a navigation system, inform the customer that the accuracy of the navigation system needs to be checked.

MEMOSKOP C-E

NOTE

Check the software status of the newly delivered MEMOSKOP. If the software status of the MEMOSKOP differs from that of the system, the system software status must be downloaded to the MEMOSKOP. The MEMOSKOP software status is displayed in the 2nd line of the User Setup. The first number describes the MEMOSKOP type (2=CE; 3=CE-100/ C/ C & MOD; 4=C-SUB/ C-SUB & MOD).

NOTE

Read and record the parameters for MEMOSKOP C-E if you are able to select User setup. After replacing the MEMOSKOP, configure the MEMOSKOP C-E according to the parameters recorded.

- Replace the MEMOSKOP C-E.
The attachment screws are on the underside of the storage device.
- Check the software status of the MEMOSKOP. Download the system software status to the MEMOSKOP if necessary.
- Use the MEMOSKOP Service Software to import the language file.
- Configure the MEMOSKOP C-E for the correct video frequency and the number of monitors present.
Refer to Chapter 5 "MEMOSKOP C-E without Keyboard, Emulation ...", "Configuring the Video frequency" and "MEMOSKOP-Configuration for the number of existing monitors".
- Configure the following parameters in Technical Setup for the MEMOSKOP:

Number of monitors	Configure 1 for SIREMOBIL Compact L with 1 monitor. Configure 2 for SIREMOBIL Compact L with 2 monitors.
Hardcopy	Check whether 5000 is programmed in "4 Max Hard-copy time". If not, program this value.
Edge 1 coef set	Check whether 3 is programmed, if not, program this value.
Edge 2 coef set	Check whether 8 is programmed, If not, program this value.
Motion detection setup	Check whether the following are programmed MD1: Threshold 100 and with MD2: Threshold 120. If not, program these values.
Date / Time format	Set to country-specific format.
Keyboard	Set to the keyboard layout being used.
Display of realtime clock	Configure Yes. Configure No only upon customer request.
Display of rotated image	Configure Yes.
Monitor zoom	Configure No.
Default LUT	Configure 2. Program a different LUT curve only upon customer request.

Default Edge	Configure 1. Program a different Edge enhancement value only upon customer request.
Monitor split	Configure Yes.
Monitor text	Configure Yes.
Disable dose rate selection in user setup	Set to "No" if equipped with an area dose product measurement device. Menu "Storage of Dose on Disk" and Menu "Dose on Hardcopy output in User Setup are visible. Otherwise, set to "Yes".
Unit serial number	Program the serial number of the SIREMOBIL Compact L. Do not enter the first zero.
Product name	SIREMOBIL Compact L (default). If wrong, configure "SIREMOBIL Compact L".
Default program changeable	Default: Yes. Depending on country specific regulations, configure Yes or No.
Software backward compatible	Configure No.

- Configure the following parameters in User setup for MEMOSKOP:

Operating mode Parameters	Upon customer request, change the parameters programmed for the organ program.
VCR output	Configure to Monitor A.
Hardcopy Release	For SIREMOBIL Compact L with 1 monitor: Configure to monitor A. For SIREMOBIL Compact L with 2 monitors: Configure to monitor B.
Text monitor	For SIREMOBIL Compact L with 1 monitor: Configure to monitor A. For SIREMOBIL Compact L with 2 monitors: Configure to both monitors.
Split Screen	Configure horizontally. Configure vertically only upon customer request.
Display of time	Configure Yes.
Set Date Time	Set the current date and time.
Hospital Name	Program the hospital name.
Storage Dose on Disk	If the area dose product meter is present, (Diamentor) configure Yes. Otherwise, configure No.
Dose on hard copy output	If the area dose product meter is present, (Diamentor) configure Yes. Otherwise configure No.

- Perform the IQ quick test.

MEMOSKOP C-E 100

NOTE

Check the software status of the newly delivered MEMOSKOP. If the software status of the MEMOSKOP differs from that of the system, the system software status must be downloaded to the MEMOSKOP. The MEMOSKOP software status is displayed in the 2nd line of the User Setup. The first number describes the MEMOSKOP type (2=CE; 3=CE-100/ C/ C & MOD; 4=C-SUB/ C-SUB & MOD).

NOTE

The image storage MEMOSKOP C-E 100 is a new image storage that works only with the correct number of images. For this reason, if the image storage was set to its default values (Menu "Diagnostics," "Load Factory Defaults"), the parameter "Maximum image numbers" must be set to 100 images.

Read and record the parameters for MEMOSKOP C-E 100 if you can select User setup. After replacing the MEMOSKOP, configure the MEMOSKOP C-E 100 according to the parameters noted.

- Replace the MEMOSKOP C-E 100.
The attachment screws are accessible on the underside of the storage device.
- Check the software status of the MEMOSKOP. Download the system software status to the MEMOSKOP if necessary.
- Use the MEMOSKOP Service Software to import the language file.
- Set the MEMOSKOP C-E 100 to the correct video frequency and configure it for the number of existing monitors.
Refer to Chapter 5 "Configuring the video frequency " and "MEMOSKOP - Configuration for the number of existing monitors".
- Configure the following parameters in Technical Setup for MEMOSKOP:

Number of monitors	Configure 1 for SIREMOBIL Compact L with 1 monitor. Configure 2 for SIREMOBIL Compact L with 2 monitors.
Hardcopy	Check whether 5000 is programmed in "4 Max Hard-copy time". If not, program this value.
Edge 1 coef set	Check whether 3 is programmed, If not, program this value.
Edge 2 coef set	Check whether 8 is programmed, If not, program this value.
Motion detection setup	Check whether the following are programmed "MD1: Threshold" 100 and for "MD2: Threshold" 120. If not, program these values.
Date / Time format	Set the country-specific format.
Keyboard	Set to the keyboard layout being used.
Language	Set for language of the country.

Display of realtime clock	Configure Yes. Select No only upon customer request.
Display of rotated image	Configure Yes.
Monitor zoom	Configure No.
Monitor split	Configure Yes.
Monitor text	Configure Yes.
Maximum image number	Configure 100.
Disable dose rate selection in user setup	Set to "No" if equipped with an area dose product measurement device. Menu "Storage of Dose on disk" and menu "Dose on Hardcopy output" in User setup are visible. Otherwise, set to "Yes".
Unit serial number	Program the serial number of the SIREMOBIL Compact L. Do not enter the first zero.
Product name	SIREMOBIL Compact L (default). If wrong, configure "SIREMOBIL Compact L".
Default Program changeable	Default: Yes. Depending on country specific regulations configure Yes or No.
Create External disk	Configure No.
Default LUT	Configure 2. Program a different LUT curve only upon customer request.
Default edge	Configure 1. Program a different Edge enhancement value only upon customer request.
Software backward compatible	Configure No.
Configure the following parameters in User setup for MEMOSKOP:	
Operating mode Parameters	Change the programmed parameters only upon customer request.
VCR output	Configure to monitor A.
Hardcopy Release	For SIREMOBIL Compact L with 1 monitor: configure to monitor A. For SIREMOBIL Compact L with 2 monitors: Configure to monitor B.
Text monitor	For SIREMOBIL Compact L with 1 monitor: configure to monitor A. For SIREMOBIL Compact L with 2 monitors: configure to both monitors.
Split screen	Configure horizontally. Configure vertically only upon customer request.
Display of time	Configure Yes.

- | | |
|-------------------------|---|
| Set Date Time | Set the current date and time. |
| Hospital Name | Program the hospital. |
| Storage of Dose on disk | If area dose product meter is present, (Diamentor) configure Yes. Otherwise configure No. |
| Dose on hardcopy output | If area dose product meter is present, (Diamentor) configure Yes. Otherwise configure No. |
- Perform the IQ quick test.

MEMOSKOP C/ MEMOSKOP C & MOD**NOTE**

Check the software status of the newly delivered MEMOSKOP. If the software status of the MEMOSKOP differs from that of the system, the system software status must be downloaded to the MEMOSKOP. The MEMOSKOP software status is displayed in the 2nd line of the User Setup. The first number describes the MEMOSKOP type (2=CE; 3=CE-100/ C/ C & MOD; 4=C-SUB/ C-SUB & MOD).

NOTE

Read and record the parameters for MEMOSKOP if you can select User setup. After replacing the MEMOSKOP, configure the MEMOSKOP according to the parameters noted.

- Replace the MEMOSKOP C.
The attachment screws are accessible on the underside of the storage device.
- Check the software status of the MEMOSKOP. Download the system software status to the MEMOSKOP if necessary.
- Use the MEMOSKOP Service Software to import the language file.
- Set the MEMOSKOP C to the correct video frequency and configure it for the number of existing monitors.
Refer to Chapter 5 "Configuring the video frequency " and "MEMOSKOP - Configuration for the number of existing monitors".
- Configure the following parameters in Technical Setup for MEMOSKOP:

Number of monitors	Configure 1 for SIREMOBIL Compact L with 1 monitor. Configure 2 for SIREMOBIL Compact L with 2 monitors.
Hardcopy	Check whether 5000 is programmed in "4 Max Hard-copy time". If not, program this value.
Edge 1 coef set	Check whether 3 is programmed, If not, program this value.
Edge 2 coef set	Check whether 8 is programmed, If not, program this value.
Motion detection setup	Check whether the following are programmed "MD1: Threshold" 100 and for "MD2: Threshold" 120. If not, program these values.
Date / Time format	Set the country-specific format.
Keyboard	Set to the keyboard layout being used.
Language	Set for language of the country.
Display of realtime clock	Configure Yes. Select No only upon customer request.
Display of rotated image	Configure Yes.
Monitor zoom	Configure No.
Monitor split	Configure Yes.

Monitor text	Configure Yes.
Maximum image number	Configure 700.
Disable dose rate selection in user setup	Set to "No" if equipped with an area dose product measurement device. Menu "Storage of Dose on Disk" and menu "Dose on Hardcopy output" in User Setup are visible. Otherwise, set to "Yes".
Unit serial number	Program the serial number of the SIREMOBIL Compact L, Do not enter the first zero.
Default LUT	Configure 2. Only upon customers request program a different LUT curve.
Default Edge	Configure 1. Only upon customers request program a different. Edge enhancement value
Software backward compatible	Configure No.
Product name	SIREMOBIL Compact L (default). If wrong, configure "SIREMOBIL Compact L".
Default Program changeable	Default: Yes. Depending on country specific regulations, configure Yes or No.
Create External disk	If a MOD-drive is present or the option "DICOM bridge" is installed, configure Yes. Without MOD drive or DICOM bridge, configure No.
Enable Bridge	If the option "DICOM bridge" is installed, configure Yes. Otherwise configure No.
• Configure the following parameters in User setup for MEMOSKOP:	
Operating mode Parameters	Change the programmed parameters only upon customer request.
VCR output	Configure to monitor A.
Hardcopy Release	For SIREMOBIL Compact L with 1 monitor: configure to monitor A. For SIREMOBIL Compact L with 2 monitors: Configure to monitor B.
Text monitor	For SIREMOBIL Compact L with 1 monitor: configure to monitor A. For SIREMOBIL Compact L with 2 monitors: configure to both monitors.
Split screen	Configure horizontally. Configure vertically only upon customer request.
Display of time	Configure Yes.
Set Date Time	Set the current date and time.

Hospital Name

Program the hospital.

Storage of Dose on disk

If area dose product meter is present, (Diamentor) configure Yes. Otherwise configure No.

Dose on hardcopy output

If area dose product meter is present, (Diamentor) configure Yes. Otherwise configure No.

- Perform the IQ quick test.

MEMOSKOP C-SUB/ MEMOSKOP C-SUB & MOD

NOTE

Check the software status of the newly delivered MEMOSKOP. If the software status of the MEMOSKOP differs from that of the system, the system software status must be downloaded to the MEMOSKOP. The MEMOSKOP software status is displayed in the 2nd line of the User Setup. The first number describes the MEMOSKOP type (2=CE; 3=CE-100/ C/ C & MOD; 4=C-SUB/ C-SUB & MOD).

NOTE

Read and record the parameters for MEMOSKOP C-SUB if you can select User setup.
After replacing, configure the MEMOSKOP C-SUB according to the parameters recorded.

- Replace the MEMOSKOP C-SUB.
The attachment screws are accessible on the underside of the storage device.
- Check the software status of the MEMOSKOP.
- Download the system software status to the MEMOSKOP if necessary.
- Use the MEMOSKOP Service Software to import the language file.
- Set the MEMOSKOP C-SUB to the correct video frequency and configure it for the number of existing monitors.
Refer to Chapter 5 "Configuring the video frequency " and "MEMOSKOP - Configuration for the number of existing monitors".
- Configure the following parameters in Technical Setup for MEMOSKOP:

Number of monitors	Configure 1 for SIREMOBIL Compact L with 1 monitor. Configure 2 for SIREMOBIL Compact L with 2 monitors.
Hardcopy	Check whether 5000 is programmed in "4 Max Hard-copy time". If not, program this value.
Edge 1 coef set	Check whether 3 is programmed, If not, program this value.
Edge 2 coef set	Check whether 8 is programmed, If not, program this value.
Motion detection setup	Check whether the following are programmed "MD1: Threshold" 100 and for "MD2: Threshold" 120. If not, program these values.
Date / Time format	Set the country-specific format.
Keyboard	Set to the keyboard layout being used.
Language	Set for language of the country.
Display of realtime clock	Configure Yes. Select No only upon customer request.
Display of rotated image	Configure Yes.
Monitor zoom	Configure No.

Monitor split	Configure Yes.
Monitor text	Configure Yes.
Maximum image number	Configure 800.
Disable dose rate selection in user setup	Set to "No" if equipped with an area dose product measurement device. Menu "Storage of Dose on Disk" and menu "Dose on Hardcopy output" in User Setup are visible. Otherwise, set to "Yes".
Unit serial number	Program the serial number of the SIREMOBIL Compact L. Do not enter the first zero.
Subtraction K-Factor, phase A	Program "32". Program a different value only upon customer request.
Subtraction K-Factor, phase B	Program "MD 2". Program a different value only upon customer request.
Product name	SIREMOBIL Compact L (default). If wrong, configure "SIREMOBIL Compact L".
Default Program changeable	Default: Yes. Depending on country specific regulations, configure Yes or No.
Create External disk	If a MOD-drive is present or the option "DICOM bridge" is installed, configure Yes. Without MOD drive or DICOM bridge, configure No.
Enable Bridge	If the option "DICOM bridge" is installed, configure Yes. Otherwise configure No.
Software backward compatible	Configure No.
Default LUT	Configure 2. Only upon customers request program a different LUT curve.
Default Edge	Configure 1. Only upon customers request program a different. Edge enhancement value
Default LUT for subtraction	Configure 1. Only upon customers request program a different LUT curve.
Subtraction Time of phase A	Program "4.5". Program a different value only upon customer request.
Roadmap K-Factor, phase A	Program "32". Program a different value only upon customer request.
Roadmap K-Factor, phase B	Program "MD 2". Program a different value only upon customer request.
Roadmap K-Factor, phase C	Program "MD 2". Program a different value only upon customer request.
Roadmap Time of phase A	Program "4.5". Program a different value only upon customer request.

- Configure the following parameters in User setup for MEMOSKOP:

Operating mode Parameters	Change the programmed parameters only upon customer request.
VCR output	Configure to monitor A.
Hardcopy Release	For SIREMOBIL Compact L with 1 monitor: configure to monitor A. For SIREMOBIL Compact L with 2 monitors: Configure to monitor B.
Text monitor	For SIREMOBIL Compact L with 1 monitor: configure to monitor A. For SIREMOBIL Compact L with 2 monitors: configure to both monitors.
Split screen	Configure horizontally. Configure vertically only upon customer request.
Display of time	Configure Yes.
Set Date Time	Set the current date and time.
Hospital Name	Program the hospital.
Storage of Dose on Disk	If area dose product meter is present, (Diamentor) configure Yes. Otherwise configure No.
Dose on hardcopy output	If area dose product meter is present, (Diamentor) configure Yes. Otherwise configure No.

- Perform the IQ quick test.

MEMOSKOP CX200**NOTE**

Check the software status of the newly delivered MEMOSKOP. If the software status of the MEMOSKOP differs from that of the system, the system software status must be downloaded to the MEMOSKOP. The MEMOSKOP software status is displayed in the last line of the "System Configuration" window.

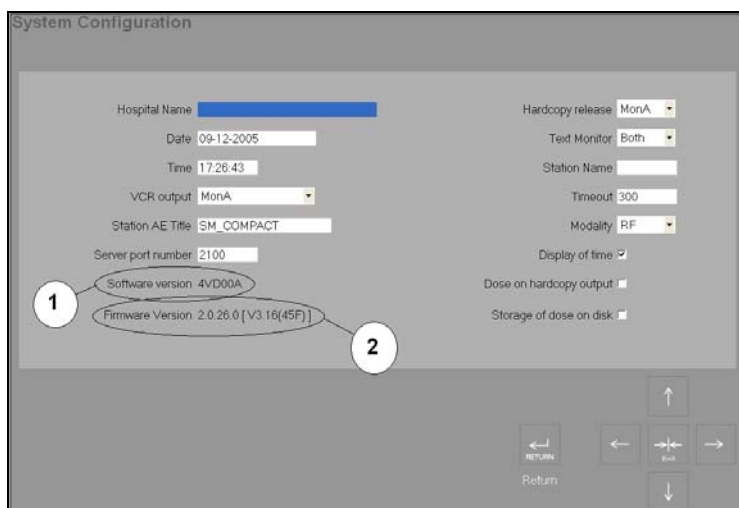


Fig. 10 Bedienung Beispiel 1

- Replace the MEMOSKOP CX200
- Remove the dongel from the old MEMOSKOP CX200 and connect it at the new MEMOSKOP CX200.
- Connect all cables and connectors to the MEMOSKOP CX200.
- Switch on the system.
- Check the software status of the MEMOSKOP CX200:
Open the user setup window.
Open the System Parameters window.
1 / Fig. 10 shows the software version of the MEMOSKOP CX200 integrated PC operating system
2 / Fig. 10 shows the software version of the MEMOSKOP CX200 Image storage
- If necessary, download the adequate software to the MEMOSKOP CX200.
See section "MEMOSKOP CX200 Image storage load of the software" and / or section "MEMOSKOP CX200 Loading the operating system (Image CD)"
- Restore the user setup, technical setup and licenses with the MEMOSKOP CX200 restore function. See section "MEMOSKOP CX200 Restore"
- Perform the Image Quality Quick Test.

MULTISPOT 2000



WARNING

Electrical voltage!
See Chapter 1, Safety Information.

Switch the system power supply off and disconnect the power plug.

Before installing the new MULTISPOT 2000, set the correct refresh rate.

50 Hz refresh rate		60 Hz refresh rate	
Jumper	Position	Jumper	Position
X4	b	X4	a
X5	open	X5	open
X6	b	X6	a
X7	b	X7	a
X8	b	X8	a
X9	b	X9	a
X10	b	X10	a
X11	b	X11	a

Tab. 1

- Disconnect the SIREMOBIL Compact L line voltage plug from the receptacle.
- Replace the MULTISPOT 2000.
- The screws securing the MULTISPOT 2000 are accessible on the underside of the camera.
- Perform a camera function test after the replacement.
- Generate and program the exposure parameters for the MULTISPOT 2000 according to the IQ Quick test (refer to the log book). Record the new exposure parameters in the IQ Quick test instructions.

Area dose product measurement device

- Remove the SIREPHOS cover (see Chapter 1, "Covers").
- Replace the electronics board and the dose measurement chamber.
- Perform the calibration of the area/dose product measurement device. Refer to Chapter 5 "Calibrating the Area Dose Product Measurement".
- Test the accuracy of the area dose product measurement device. Refer to Chapter 5 "Testing the accuracy of the area dose product measurement device".
- Re-attach the SIREPHOS cover.
- Seal the SIREPHOS cover using sealing compound (see Chapter 1, "Covers").

Laser Light Localizer (Sirephos-side)

- Remove the SIREPHOS cover (see Chapter 1, "Covers").
- Replace the laser diodes after removing the plastic bracket and desoldering the wires.
- Adjust the laser diodes using the adjustment device supplied with the laser targeting device.
- Re-attach the SIREPHOS cover.
- Seal the SIREPHOS cover using sealing compound (see Chapter 1, "Covers").

Brake forces



Risk of physical injury and damage to property!

When performing service work on the horizontal slide of the basic unit (for example when performing repair work on the brake of the C-arm horizontal travel) it is possible that the C-arm may slide out of its position and drop onto the floor after the end stop has been removed.

Before dismantling the end stop, the horizontal travel brake must be locked and the horizontal slide must be mechanically locked in order to prevent it from sliding out. For example, the basic unit can be positioned in the room in such a way that the C-arm mechanically touches one of the walls.

See also page 1- 8 "Back stop plate at the C-arm horizontal support"

- Position prerequisites for measuring the forces: angulation, orbital, and horizontal swivel movements must be at zero on the scale and horizontal movement should be at 20 on the scale.
- All measurements should be made with a spring measure on the railing near the image intensifier with the DHHS spacer, if present, installed on the X-ray tube.

SIREMOBIL Compact L

Movement	Nominal values		Comments
	Brake released:	Brake applied:	
Horizontal travel	10 N to 40 N	160 N to 200 N	n.a.
Angulation movement	10 Nm to 20 Nm	60 Nm to 80 Nm	n.a.
Orbital movement	10 Nm to 24 Nm	60 Nm to 80 Nm	measure with the C-arm in vertical position.
Horizontal swivel	5 Nm to 10 Nm	90 Nm to 150 Nm	n.a.

Lubricating the vertical lifting column

- The spindle in the vertical lifting column should be lubricated during annual maintenance.
- Raise the vertical lifting column approximately 50 cm. A round cap for covering the hole is visible in the column.
- Remove the cap.
- In the center of the vertical lifting column, a spindle is mounted.
- Around the spindle, a hopper is mounted.
- Fill this hopper with approximately 2 cm³ of oil.
- Drive the vertical lifting column 2 times completely up and down.
The vertical lifting column may not produce squealing noise.
If necessary, repeat lubricating the spindle of the vertical lifting column.

Oil to be used:

Special purpose oil (Optimol GmbH; Viscogen KL300; 40 g),
Item number 73 95 353 RH090

WARNING

X-ray radiation!
See Chapter 1, Safety Information.
Protect yourself against radiation exposure. Wear a lead apron.

NOTE

When measuring the tube current, the distribution current must be derived from the measured value. The distribution current depends upon the kV and is calculated according to Ohm's law. The distribution resistance is 400 MOhm.



- Switch OFF SIREMOBIL Compact L.
- Remove jumper X97 from board D1.
- Connect the mA measuring device at D1.X39 and D1.X40.
- Switch ON SIREMOBIL Compact L.
- Release radiation and read the overall current.
- Read out the kV value produced while the current is being measured.

Calculate the tube current as follows:

$$\text{tube current [mA]} = \text{overall current [mA]} - \frac{\text{high voltage [kV]}}{\text{distribution resistance [MOhm]}}$$

e.g.:

At 110kV, an overall current of 5.275 mA is measured.

$$\text{tube current [mA]} = 5.275 \text{ [mA]} - \frac{110 \text{ [kV]}}{400 \text{ [MOhm]}} = 5.275 \text{ [mA]} - 0.275 \text{ [mA]} = \underline{5.0 \text{ [mA]}}$$

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Chapter 1	Notes on the protective conductor resistance test added. Notes on system leakage current measurement added. Notes on Navigation systems, used with the SIREMOBIL Compact L added.
Chapter 3	Work step for systems used with navigation systems added.
Chapter 4	MEMOSKOP CX200 service descriptions added.
Chapter 5	Work step for systems used with navigation systems added. MEMOSKOP CX200 service descriptions added.
Chapter 6	Work step for systems used with navigation systems added. MEMOSKOP CX200 service descriptions added.

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